RECEIVED
JUL 07 1993
DEPT. OF ECOLOGY

Interim Measures Assessment Report

for

Rhône-Poulenc Inc.'s Marginal Way Facility Seattle, Washington

Prepared for

U.S. Environmental Protection Agency Region 10

by

CH2M HILL

July 6, 1993





Executive Summary

In compliance with Administrative Order on Consent No. 1091-11-20-3008(h), Rhône-Poulenc Inc. (RPI) has evaluated the need for additional interim measures at the Marginal Way facility. Based on the factors discussed herein, the following activities are proposed as interim measures:

- Removal of light nonaqueous phase liquid (LNAPL)
- Monitoring well rehabilitation

These interim measures are proposed to facilitate the implementation of other activities being done as part of the RCRA Corrective Action process. Only these two interim measures are proposed at this time because:

- Many potential site stabilization issues were addressed by previous interim
 activities (which included demolition and removal of structures and storage
 tanks, removal and disposal of chemicals used in past manufacturing processes, and revisions to the site sewer systems). As a result, no interim
 measures have been proposed in this report for stabilization purposes.
- No imminent threats to human health and the environment that require immediate action have been identified at this time.
- Although additional areas of contamination have been identified at the site, there is not enough existing data on the nature and extent of that contamination to adequately define an appropriate interim measure at this time.
- The need for and opportunity to implement additional interim measures will continue to be evaluated as more information is obtained (during the RCRA Facility Investigation and other remedial activities).

10025BBB.SEA

Contents

		Page
Exec	Executive Summary	
Intro	oduction	1
Sum	mary of Existing Data	2
	Hydrogeologic Conditions	2
	Summary of Previous Site Assessments	2 2 3 8
	Potential for Human and Environmental Exposure	8
	Previously Conducted Interim Measures	9
Proposed Interim Measures		13
-	Other Interim Measures Considered	14
References		16
Tab	le	
1	Wastes and Materials Removed from RPI's Marginal Way Facility Since Manufacturing Ceased in March 1991	12
Figu	ires	
1 .	Soil Sampling Areas Shown in Figure 2-2 of the Dames & Moore Site Screening Investigation, Final Report, October 1986	5
2	Detailed Site Plan and SWMU Locations	6

10025FF1.SEA

Introduction

Rhône-Poulenc Inc. (RPI) entered into Administrative Order on Consent No. 1091-11-20-3008h ("the Order") on May 6, 1993, for its RCRA operations at the Marginal Way facility. As part of the Order, RPI is required to evaluate available site data, assess the need or opportunity for interim measures, and propose any appropriate interim measures (Item VI.A). This Interim Measures Assessment Report is the result of this evaluation and is being submitted to EPA Region 10.

In preparation of this Interim Measures Assessment Report, RPI relied on RCRA Corrective Action Interim Measures Guidance, Interim Final (US EPA, June 1988, EPA/530-SW-88-029, OSWER Directive 9902.4). A summary of the intent of the implementation of interim measures is useful in evaluating appropriate actions at the Marginal Way facility:

Interim measures are implemented as the first phase of Corrective Action to quickly "address actual exposures (imminent risks) and to prevent the further spread of contamination." Interim measures are developed in order to "stabilize, control, or limit further releases [from a RCRA facility] and can be implemented at any point in the [Corrective Action] process where there is an immediate threat to human health or the environment." These measures "may be appropriate for a facility under the following conditions:

- There are releases at the facility which pose actual or imminent exposure threats to humans or ecosystems at levels of concern;
- There are releases that, if not addressed expeditiously, will result in further significant contamination of environmental media in the near to mid-term (e.g., 5 to 10 years); or
- The site characteristics suggest that the site may be amenable to measures designed to control or abate imminent threats or prevent or minimize the further spread of contamination."

This emphasis on using interim measures as part of the Corrective Action Program is called the RCRA Stabilization Strategy. EPA does recognize that at some sites such measures may not be possible or appropriate. If implemented, interim measures need to be consistent with the final remedy and the site and waste conditions.

This Interim Measures Assessment Report summarizes available data; addresses the need or opportunity for interim measures; discusses interim measures previously implemented; and proposes additional interim measures, where appropriate.

Summary of Existing Data

The site-specific documents reviewed for this assessment include the following:

- Dames & Moore, "Site Screening Investigation Final Report," prepared for Rhône-Poulenc Inc., Seattle, Washington, October 1986
- PRC Environmental Management, Inc., "Rhône-Poulenc Inc., Marginal Way Facility, Seattle, Washington, RCRA Facility Assessment Final Report," prepared for U.S. Environmental Protection Agency, Office of Waste Programs Enforcement, Washington, D.C., March 19, 1990
- Landau Associates, Inc., "Site Assessment, RPI Facility, Tukwila, Washington," prepared for Boeing Environmental Affairs, Seattle, Washington, September 10, 1991

In general, these documents reflect known site conditions before the manufacturing processes at the facility were shut down in March 1991 and demolition occurred during the spring of 1992. The changes in site conditions caused by demolition are discussed later in this report.

Hydrogeologic Conditions

RPI's Marginal Way facility is located in the Duwamish River Valley. In the immediate vicinity of the site, hydraulic fill consisting of sediments dredged from the Duwamish River is present in the upper 5 to 15 feet of the subsurface. The fill is underlain by alluvial silt and sand to depths of approximately 50 feet below ground surface (bgs). Gravel, sand, silt, and clay deposits of marine origin underlie the alluvial sediments to depths of over 100 feet. Available site data suggest that the marine sediments may be underlain by glacial till.

The hydrostratigraphy of the (approximately) upper 100 feet was described by Dames & Moore (1986) as a five-layer system. This five-layer model includes two aquifers: one unconfined and one confined. The five hydrostratigraphic units described by Dames & Moore are listed below (from top to bottom):

- Unsaturated Zone. The unsaturated zone is composed primarily of silty sand and gravel. The upper portion of this zone is hydraulic fill in most areas. Localized areas of nonhydraulic construction fill may also be present. Low-permeability silt and clay beds in the lower portions of this zone may cause perched groundwater conditions during part or all of the year.
- Upper Aquifer. The upper aquifer consists of alluvial sands and silty sands deposited by the Duwamish River. The upper aquifer is generally

unconfined, its upper boundary being defined by the water table present at a depth of approximately 5 to 15 feet bgs. The aquifer may be locally confined or semiconfined by the above-mentioned low-permeability silt and clay beds. Past borings indicate that the upper aquifer is laterally continuous beneath the site and is approximately 50 feet thick.

- Upper Aquitard. The upper aquitard consists of silt and clay of alluvial origin. The aquitard serves as a confining layer for the lower aquifer (discussed below). Boring logs suggest the upper aquitard is 20 to 50 feet thick and laterally continuous beneath the site.
- Lower Aquifer. The lower aquifer consists of marine sand and gravel. The potentiometric surface of this aquifer is 5 to 15 feet bgs. Several borings have been drilled into the lower aquifer. Boring B2 drilled by Dames & Moore suggests that the aquifer may be about 20 feet thick.
- Lower Aquitard. Glacial till and weathered siltstone are reportedly present beneath the lower aquifer. The thickness of the lower aquitard is unknown.

Groundwater levels in the upper and lower aquifers are affected by tidal fluctuations of the Duwamish River. Potentiometric contour maps presented by both Dames & Moore (1986) and Landau (1991) indicate that horizontal groundwater flow directions change in both aquifers from high to low tide. The Landau interpretation may be more representative of actual site conditions because of the larger number of wells available at the time of their investigation. The Landau report indicates that groundwater generally flows to the west toward the Duwamish River in both aquifers at low tide. During high tide, groundwater flow in the upper aquifer appears to reverse such that it converges on the center of the site. Groundwater flows to the north and northeast in the lower aquifer during high tide, away from the Duwamish River and Slip 6.

Previous studies indicate that the potentiometric surface of the confined lower aquifer is higher than that of the unconfined upper aquifer. As such, the vertical component of groundwater flow between the two aquifers is upward, across the upper aquitard.

Groundwater flow velocities in the upper and lower aquifers were estimated by Dames & Moore (1986). Average linear flow velocities were estimated to range from 0.01 to 5.0 ft/day in the upper aquifer and 0.0006 to 0.5 ft/day in the lower aquifer.

Additional investigations will be conducted during the RCRA Facility Investigation (RFI) to augment and refine existing hydrogeologic data for the Marginal Way facility.

Summary of Previous Site Assessments

Four assessments of the contamination at the site have been conducted--by Dames & Moore (1981, 1986), PRC for the RFA (1990), and Landau (1991). The current understanding of

site characteristics and contaminants have been based on these assessments. Integration of these findings into an overall remedial strategy for the site will be discussed in the RFI Workplan.

Dames & Moore's Assessments. In 1981 and 1986 Dames & Moore performed initial evaluations of potential soil and groundwater contamination at the RPI site. In 1986 four-teen areas were selected for investigation based on data available on past activities (see Figure 1), and soil and groundwater samples were collected from soil borings and groundwater monitoring wells.

Toluene was concluded to be the most significant volatile compound present in soils. High concentrations were found in sampling areas B and H, which were near plant operations.

Perched groundwater was concluded to have significant concentrations of toluene, methylene chloride, 2-butoxyethanol, and vanillin in this zone at DM-4 and/or DM-5. "Black liquid" was concluded to "not contain detectable quantities of any of the Hazardous Substance List compounds."

Shallow groundwater contamination concluded to be related to site activities included toluene, formaldehyde, and vanillin, although the formaldehyde results were subject to question due to the presence of this material in an upgradient well near the east boundary of the plant. The presence of chromium was also observed in shallow groundwater. Deep groundwater was considered not to be affected by onsite activities.

PRC's 1990 RFA. In 1990 PRC Environmental Management performed a RCRA Facility Assessment (RFA) of the Marginal Way facility for EPA Region 10. The RFA relied on the Dames & Moore studies for information about contamination and site characteristics. In this assessment, 12 solid waste management units (SWMUs) were identified at the site (see Figure 2). These sites were:

SWMU 1-RCRA hazardous waste storage area

SWMU 2-Storage and distribution center building complex

SWMU 3-General processing area

√ SWMU 4-Oil storage area

SWMU 5-Satellite accumulation area (laboratory)

SWMU 6-Containment reservoir and sumps

SWMU 7-Storage and maintenance building area

SWMU 8-Storage tanks for raw materials, by-products, and waste streams

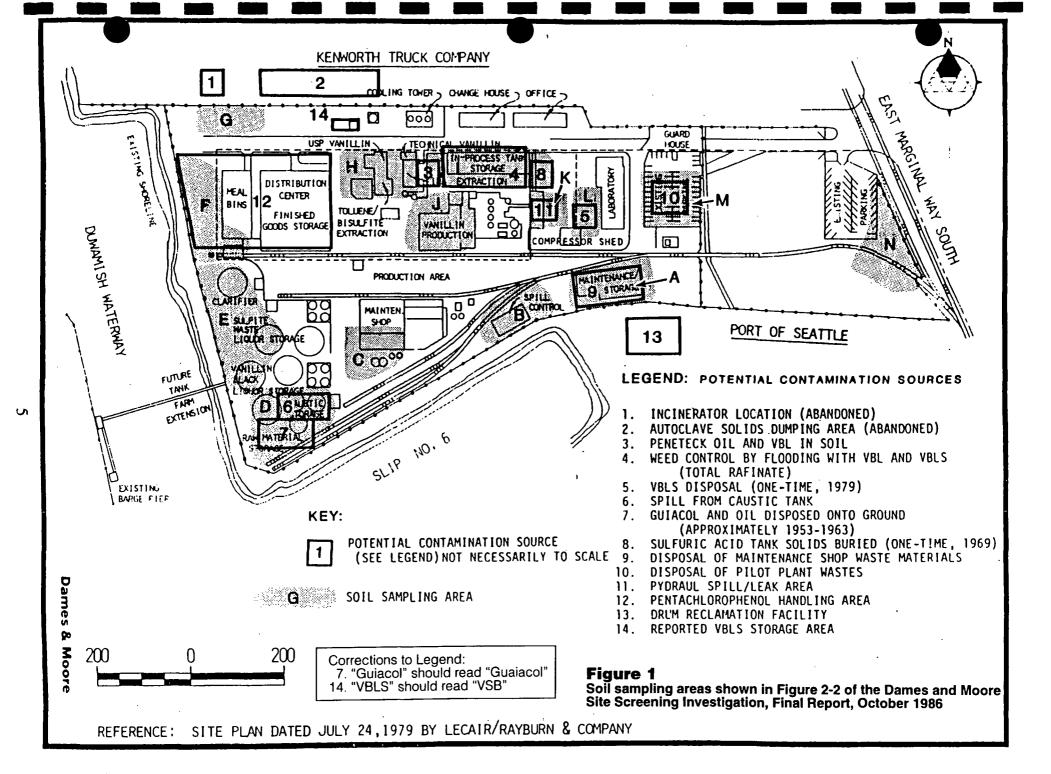
SWMU 9-Vanillin black liquor solids (VBLS) clarifier and filter building

SWMU 10-Wastewater treatment units (API separators)

SWMU 11-Site of former maintenance shop/storage building

SWMU 12-North surface storage area

Of these 12 units, SWMUs 2, 3, 5-8, and 10-12 were identified as needing a RCRA Facility Investigation (RFI). SWMUs 1, 4, and 9 were identified as needing no further action.



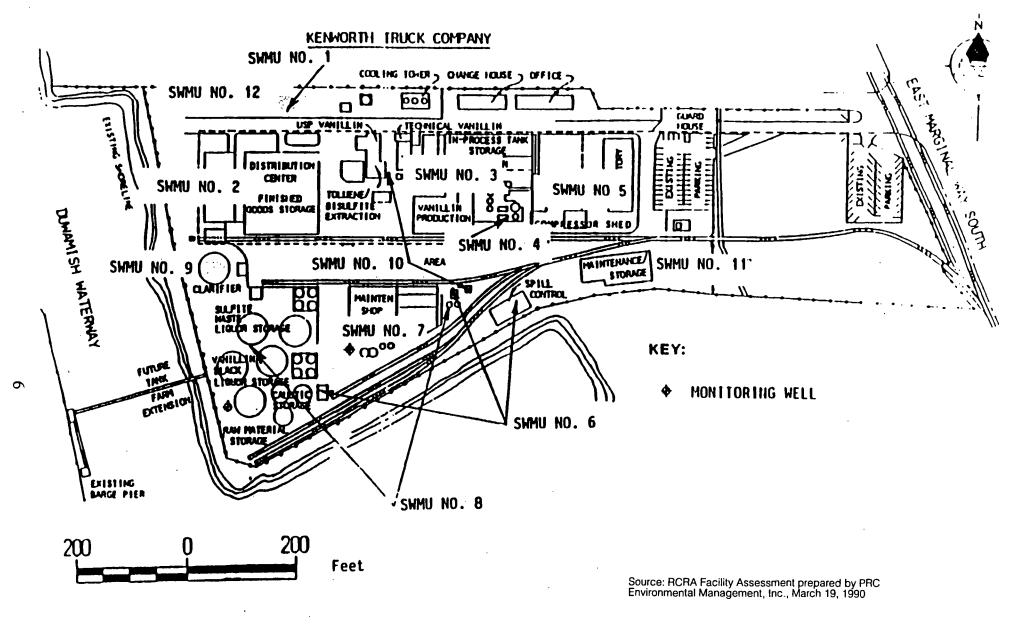


Figure 2. Detailed Site Plan and SWMU Locations

Although not associated with known contamination, the RFA also identified four other areas of concern (AOCs). These are the barge and rail loading/unloading areas, the VBLS truck loading terminal, an abandoned outfall (originally designated Outfall No. 2) to Slip 6 of the Duwamish Waterway, and the plantwide surface drainage systems.

Landau's 1991 Investigation. The assessment was prepared to evaluate the potential environmental liability of the site for a prospective buyer. Landau Associates investigated site soil and groundwater quality on the upland portion of the site. They also evaluated sediment and groundwater discharge seeps along the property's boundary with the Duwamish Waterway. The Landau report identified the following three areas of contamination as the main candidates for potential implementation of interim measures:

MW-G5 Area. The MW-G5 Area is located in the central portion of the plant site, north of Slip 6 and east of the Duwamish Waterway and the former clarifier. In this area a floating light nonaqueous phase liquid (LNAPL) organic product was identified. The type of LNAPL has not been positively identified but appears to consist of aliphatic hydrocarbons. Toluene contamination of soil and groundwater was also reported.

Sector B Area. The Sector B Area is located south of the property's boundary with Kenworth Truck Company and within the vanillin production and toluene/bisulfite extraction process areas (SWMUs No. 3, 4, and 10). Landau reported soil contamination in this area, again from toluene. Out of eight wells in Sector B, toluene was detected in only one groundwater monitoring well (DM-5) and at concentrations below 40 mg/L, the Washington State MTCA cleanup level. Basically, groundwater in the Sector B area does not appear to be significantly contaminated.

Black Liquid Area. Black liquid was reported by Landau in two separate locations: due east of the Duwamish shoreline in the bulk tank storage area, and north of the vanillin production process area. Upper aquifer monitoring wells in these locations reportedly contain a dark brown to black liquid, although the one lower aquifer well in this area (MW-H1) did not have the liquid. Dames & Moore had also reported black liquid in the shallow groundwater in Wells DM-2A, DM-4, DM-5, and DM-8, and in the perched groundwater in Wells DM-4 and DM-5.

Groundwater contaminants identified in the Black Liquid Area include chromium and high total organic carbon (TOC) levels. Available data suggest that soluble chromium is approximately co-distributed with the black liquid, but the distribution and chemical characteristics of the chromium have not been fully defined. There is insufficient information at this time to determine the source of the higher chromium concentrations or the concentrations currently present in site soil.

Sediments and Seeps. The Landau assessment also included sediment and seep sampling in the intertidal area of the Duwamish Waterway adjacent to the plant. Only one sediment sample (SD-J1-0.0-0.5, near the north end of the Duwamish Waterway shoreline) exceeded any of Washington State Sediment Management Standard Cleanup Levels (WAC 173-204);

this sample exceeded the cleanup level for bis(2-ethylhexyl)phthalate (DEHP). DEHP was also found in the laboratory blank but at much lower concentrations, indicating that the laboratory result may not be significant. One seep sample reportedly resembled the groundwater observed in the Black Liquid Area.

Potential for Human and Environmental Exposure

At the present time, the site has been secured by fences and locked gates. There are currently no manufacturing operations at the site, and any future concurrent uses of the site will be conducted independently of Corrective Action work. In addition, most of the site has been paved. All these factors minimize the potential for direct human or animal contact with soils and exposure to soil contaminants.

The Duwamish River is classified as a Class B Waterway. Because of its proximity to Elliott Bay, and because of the extensive industrial development there, the river is unsuitable for drinking water. The RFA notes that groundwater is not used for a potable water supply in the vicinity of the site and concludes, "no human targets appear to be at risk."

MW-G5 Area. Currently, the LNAPL in the MW-G5 Area does not appear to pose an imminent threat to human health or the environment. Because no oily sheen is visible on the banks of the Duwamish Waterway or on Slip 6, the LNAPL does not appear to have migrated to the west or south. These areas will continue to be observed for evidence of releases in the future.

Sector B Area. As mentioned above, access to the site is restricted and the Sector B soils are paved, minimizing the opportunity for contact by humans or animals. Furthermore, the site is totally surrounded by industrial developments or the Duwamish River.

Black Liquid Area. The black liquid detected in the groundwater does not appear to pose an imminent threat to human health or the environment. Groundwater is not used for drinking water and there does not appear to be a release to surface water.

Chromium associated with the organic-rich black liquid is not expected to be present in the hexavalent form considering the pH present (6.3 to 6.6) and the age of the contamination. The presence of soluble, divalent (ferrous) iron, Fe²⁺ codistributed with black liquid in the groundwater would further reduce the likelihood of hexavalent chromium because of its ability to rapidly and quantitatively reduce hexavalent chromium to the trivalent state.

Soluble chromium in this area must be analyzed for the relative contributions of trivalent and hexavalent forms. Alternative or supplemental methods to the commonly used 1,5-diphenylcarbazide method, such as polarography, may be necessary to eliminate known or suspected interferences in the measurement of hexavalent chromium.² Iron and other parameters must also be tested.

Sediment and Seeps. At this time, available data indicate that the sediments do not pose an imminent threat to either human health or the environment, and therefore do not require interim measures. Until the sediment tests in the RFI are completed, the applicability to any corrective measure cannot be determined.

Although metals (arsenic, lead, copper, and zinc) were detected in Landau's site investigation at two seeps, arsenic and lead were below the levels listed in the Appendices of the proposed Corrective Action regulations (July 27, 1990, 55 FR 30865 and following). Copper and zinc are not listed in the proposed regulations.

The Landau investigation and earlier studies were conducted while process operations were ongoing or had recently stopped, and before plant demolition and removal of materials in storage occurred. At the time of these earlier studies, the processes or materials stored in tanks may have caused continuing releases of contaminants to the groundwater and seeps. During a site reconnaissance conducted on May 6, 1993, to identify potential interim measures, no large seeps of visually contaminated groundwater were noted. Of the seeps shown in the Landau report, Seep 1 was not found but may have been underwater. Seeps 2 and 3 appeared to be dry; one small seep, slightly tinted brown, was visible north of Seep 2 and west of Seep 3. Other groundwater seeps observed along the banks of Slip 6 and the Duwamish Waterway were not discolored. This apparent decrease in the number of visible contaminated seeps may suggest that possible sources (e.g., lignin storage tanks) were removed during the plant demolition.

Previously Conducted Interim Measures

As part of the plant's shutdown and in anticipation of the Order, RPI has implemented several interim measures during the past 2 years. These measures have included:

- Demolition of most plant facilities, including removal of deteriorated above-ground tanks
- Diversion of storm water to discharge into the Metro sanitary sewer instead of the Duwamish Waterway or Slip 6
- Cleaning out two storm-water holding sumps (SWMU 6), filling them with clean sand, and capping them with asphalt
- Closure of the RCRA storage unit (SWMU 1) in accordance with WAC 173-303 and obtaining the Department of Ecology's approval for clean closure
- Removal of process chemicals and wastes for proper disposal or reuse

Plant Demolition. Between March and June 1991, RPI demolished the majority of the buildings at the plant site. The buildings removed (and their approximate square footage) included the Vanillin Building (10,560), the Extractor Building (400), the Control Building

(600), the Maintenance Building (9,624), the Meal Bin Storage Building (8,418), the Storage Shed (1,500), the RCRA Storage Shed (2,500), and the Larox Building (1,133). These buildings were removed to ground or foundation level. Existing utilities were cut off and capped at the edge of the area being demolished. Sanitary sewer connections were cut off and plugged at the slab.

Process equipment and piping, including associated chemical products and asbestos, were also removed during plant demolition. All equipment, pipes, and tanks were steam-cleaned to remove the chemicals remaining from process operations prior to equipment removal by the demolition contractor. A certified asbestos firm removed the associated asbestos. Rinsate from other cleaning was disposed of in the Metro system.

Demolition of above-ground structures included knockdown, removal, and appropriate disposal of all salvage materials, debris, and rubble. The objectives of demolition were to:

- Remove all of the structures that could be removed without excavation or significant concrete cutting
- Leave the remaining portions of the structures in sound structural condition and posing no threat to safety
- Provide appropriate drainage from the remaining surfaces of the structures

In addition, the barge dock and unloading facilities were demolished and removed from the site. The railroad spurs were also dismantled and removed. The track and ties were removed, but the gravel ballast was left in place.

Demolition also addressed certain below-grade structures such as basements, wet wells, pits, and trenches. RPI cleaned the surfaces so that they were free of loose dirt and the majority of residual chemicals. The demolition contractor then backfilled these structures with granular material and covered them with an asphalt-treated base (ATB) material to minimize the infiltration of surface water. The areas that were filled and paved included:

- Basement of Meal Bin Storage Building
- Clarifier pit
- Wet well at the tank farm
- Cooling tower cold well
- Vanillin Building equipment trench
- Rail unloading overflow pit
- Catalyst concentrate pit

The majority of the above-ground tanks were also removed during demolition, eliminating the potential for leaks. All tanks except three (two 12,000-gallon cone bottom steel tanks and one 800,000-gallon steel tank) have been removed. The remaining tanks appear to be

in good structural condition and are available for possible use during Corrective Action (e.g., as holding tanks for possible remedial treatment processes).

Storm-Water Discharge to Metro. Historically, storm water flowed to the process drainage system or to outfalls discharging to the Duwamish Waterway or to Slip 6. The plant process drainage system was designed and operated as a "closed loop" that captured drainage from areas where process chemical spills could occur. During process operations at the plant, inflows to this system were monitored for chemical contamination. Contaminated water from this system was reused in the process or diverted to the POTW (Metro). Clean inflows from roof drains and uncontaminated street drains went directly to the storm sewer system. During demolition activities, all known flows from the process drainage system and the storm-water sewer system were diverted to Metro. Subsequent to plant demolition, portions of the process drainage system that were no longer in use were filled with lean concrete to restrict any residual contaminants that may have been present in process sewer lines from migrating offsite; the remaining process drain lines that convey storm water to the Metro sewer system continue to be operational.

Wastewater (including storm water) from the plant is now collected, analyzed for copper and chromium, and discharged on a batch basis to Metro. This discharge is regulated by a Metro Discharge Authorization effective June 16, 1993. Metro has recently requested that additional analyses be performed during the RFI to assess whether the discharge is more appropriately released via an NPDES storm-water permit (C. Wellner/Metro, personal communication to P. O'Flaherty/CH2M HILL, 5/29/93).

By rerouting the storm water to Metro, storm water potentially contaminated from contact with contaminated site soils would be treated in the Metro treatment plant and would not threaten the waters of the Duwamish or Slip 6.

Blocking Storm-Water Sumps. The containment reservoir and sumps (SWMU 6) were cleaned out, filled with clean sand, and capped with asphalt as part of the demolition. This work minimized the storm-water infiltration from the reservoir, yet allows for the potential future use of the reservoir during Corrective Action. This work, along with the rerouting of storm water to Metro, addresses the immediate concern of possible contamination from surface runoff waters.

Clean Closure of the RCRA Storage Unit. The RCRA storage unit (SWMU 1) was decontaminated and closed in accordance with an Ecology-approved closure plan. Ecology approved the interim status storage facility closure in a letter dated April 23, 1992, from Julie Sellick/Ecology to Edwin Liu/RPI. By clean-closing the unit, RPI has removed the potential threat to human health or the environment that may have existed from this SWMU. Therefore, no interim actions are required in this area.

Removal of Chemicals. Since plant production ceased, most materials that were no longer needed have been removed and disposed of at appropriate facilities. An inventory of these chemicals is presented in Table 1. No other hazardous materials or chemicals are currently

Table 1
Wastes and Materials Removed from RPI's Marginal Way Facility
Since Manufacturing Ceased in March 1991

Itam Damaral	W-i-l-4 (IL)	E-4	D-4-(-)
Item Removed	Weight (lb.)	Fate	Date(s)
Vanillin Black Liquor Solids (dry cake)	148,360	Landfill	4/91 to 5/91
Vanillin Black Liquor Solids, plus copper containing solids	472,940	Landfill	4/91 to 6/91
Copper containing solids from cleanouts	762,260	Landfill	9/91 to 6/92
Toluene-contaminated soil from well drilling	1,693	Treatment	12/91
Methylene chloride	507	Fuel	6/91
Toluene	1,948	Fuel	6/91
Oily residue from tank cleanout	975	Fuel	6/91
Isopropyl alcohol	137,060	Fuel	7/91
Petroleum naphtha	572	Recycle, Fuel	10/91 to 12/91
Lab chemicals (lab pack)	717	Miscellaneous	12/91
Turpentine, diesel, water mixture	450	Fuel	7/92
Spent mineral oil	550	Fuel	6/91
Copper sulfate	242	Supplier*	4/91
Ferric sulfate	5,440	Supplier*	4/91
Foamaster 1119A (defoamer)	12,980	Supplier*	4/91
Fuel oil	115,170	Supplier*	4/91
Peneteck oil	12,300	Supplier*	4/91
Sodium bisulfite	500	Supplier*	4/91
Sodium hydrosulfide	43,700	Another Plant*	6/91
Sulfuric acid	9,890	Another Plant*	4/91
Toluene	124,130	Supplier*	4/91

^{*}As indicated, these materials were either sent to another plant or returned to the supplier.

being stored onsite, except for small quantities of chemicals used for monitoring Metro discharges, gases needed for operating site equipment (e.g., propane), and other miscellaneous materials (e.g., paints) that are scheduled for removal.

Proposed Interim Measures

In accordance with the Order, RPI has considered additional actions that could be implemented quickly to address actual exposures (imminent risks) and to prevent the further spread of contamination. Based on the information presented herein, only two additional interim measures appear to be necessary; these are:

- Extraction of LNAPL in the MW-G5 Area
- Monitoring well rehabilitation

MW-G5 LNAPL Removal. From the available data, toluene appears to be the main groundwater contaminant at the Marginal Way facility. The LNAPL found in the MW-G5 Area, while containing toluene, does not appear to be a dominant continuing source of toluene contamination to the groundwater in this area. However, the LNAPL in this area could hinder any future toluene groundwater characterization and any toluene remediation efforts that may be required. As a result, the LNAPL is a candidate for interim measures.

The nature and extent of the toluene contamination in groundwater will be assessed in the RFI. However, the presence of this LNAPL could cause difficulties when treating the groundwater for the toluene contamination. Toluene is a volatile chemical and potentially could be removed from groundwater using a technology such as air stripping; the other nonaqueous components do not appear to be as volatile and could cause significant problems (such as fouling) for the groundwater treatment system. By removing the bulk of the LNAPL as an interim measure, some of these difficulties could be minimized. Removal of LNAPL from the MW-G5 Area is proposed as an interim measure because it will prevent the possible migration of this contamination and lessen its potential to impede effective treatment of the more treatable volatile contaminants present in this area.

A pilot test to evaluate the feasibility of recovering LNAPL from the MW-G5 Area will be conducted. At this time, it is envisioned that a skimming system manufactured by Billings Associates will be used to recover the product from either MW-G5 or a replacement well. The Billings recovery system is compatible with a fluctuating groundwater level condition and consists of a buoyant collection vessel that resides in the recovery well. A hydrophobic membrane around the circumference of the vessel allows LNAPL to be recovered without entraining groundwater. The vessel can be removed from the well and emptied as needed, or the collection vessel can be emptied using a peristaltic pump.

LNAPL recovery will be closely monitored during pilot testing. The recovery vessel will be checked and emptied daily or more often, if necessary. If the skimming device recovers

significant volumes of LNAPL, a peristaltic pump may be added to the system to allow the vessel to be emptied automatically when full. Depending on the performance of the system during pilot testing and the rate of LNAPL recovery, additional recovery wells may be installed in the MW-G5 Area as part of the interim measure activities. Such wells could be installed either before or during the RFI. Site characterization data collected in the MW-G5 Area during the RFI are expected to be particularly useful in helping identify the need for, and location of, additional recovery wells.

The technical details regarding LNAPL recovery in the MW-G5 Area will be addressed in the forthcoming Interim Measures Workplan.

Monitoring Well Rehabilitation. Both Dames & Moore and Landau installed wells as part of their investigations at the site. There are 30 monitoring wells at present at the Marginal Way facility. All of the wellheads are flush-mounted. Many are constructed such that surface water can enter the wells if the well caps and vaults are not watertight, potentially contaminating the groundwater in the wells. Since the wells were in place while the plant was operating, many of the wells were vulnerable to plant activities. Because of the length of time since well installation occurred, some of the wellheads have deteriorated. These wellheads need to be rehabilitated so that the wells can be used in the RFI. In addition, some wellheads were inadvertently covered with asphalt pavement during plant demolition. These wellheads need to be uncovered (and rehabilitated, if necessary).

This is being proposed as an interim measure because it will allow RPI to verify the integrity of existing monitoring devices, conduct interim observations of groundwater quality, and monitor the effectiveness of LNAPL removal (see above).

Rehabilitation of the monitoring wells would meet the requirements of RCRA stabilization by mitigating the immediate possible threat to groundwater from additional surface sources. Rehabilitation would include locating and inspecting each well, and identifying and making necessary repairs.

It should be noted that four monitoring wells cannot be located at this time. Some well-heads are presumed to be covered by recently placed asphalt or soil. These wellheads will be located by removing asphalt paving and excavating as needed. If any of these four wells need to be repaired or replaced, this would happen at the same time as the rehabilitation of the other wells.

As part of the well rehabilitation program, all wells would be redeveloped during the well rehabilitation effort in preparation for possible use during the RFI.

Other Interim Measures Considered

Black Liquid. No interim measures are being proposed at this time to address the black liquid found in the groundwater because not enough information exists to adequately define the extent of the contamination. The introduction to EPA's Corrective Action Stabilization

Questionnaire states (p. 4, Question 15) that stabilization measures should not be considered for implementation until adequate site characterization and waste release data are available.

This area of contamination does not readily lend itself to an interim measure because the source of contamination is unclear; the extent of the problem is not defined; and in its most likely oxidation state in this organic-rich groundwater, it does not pose an imminent risk to human health and the environment. Chemical analyses for chromium in the black liquid have nearly always been for dissolved total chromium (e.g., Cr^{+3} plus Cr^{+6}). Typically, soluble chromium in pH-neutral groundwater is in the more toxic hexavalent state; however, when a high concentration of organic matter is also present as it is in the black liquid, it is more common that the chromium is trivalent.

The July 27, 1990, proposed Corrective Action regulations Appendices (55 FR 30865 and following) list only Cr⁺⁶ (Appendix A-Examples of Concentrations meeting Criteria for Action Levels; Appendix B-Maximum Contaminant Levels; Appendix C-Range of Concentrations for Establishing Media Protection Standards for Carcinogens; and Appendix F-List of Constituents Showing Action Level Source Data). The tables do not address contamination from Cr⁺³, indicating its less toxic nature.

Seeps. As discussed above, the absence of visually contaminated seeps indicates that the continuing contaminant sources to the seeps have been removed already. Essentially, an interim measure, if any, for this contamination was completed by removal of the likely sources during demolition of the facility.

References

- 1, J.O. Nriagu and G. Nieboer, *Chromium in the Natural and Human Environments*, New York, John Wiley & Sons, 1988.
- 2. American Public Health Association, American Water Works Association, and Water Pollution Control Federation, Standard Methods for the Examination of Water and Wastewater, 17th Edition, Washington, D.C., 1989.

Uncited References

Letter from Sylvia K. Lowrance, Director, Office of Solid Waste, and Bruce M. Diamond, Director, Office of Waste Programs Enforcement, US EPA HQ, to US EPA Regions I-X RCRA Waste Management Division Directors, October 25, 1991.

US EPA. Handbook, Stabilization Technologies for RCRA Corrective Actions. EPA/625/6-91/026, August 1991.

10025B8D.SEA



RHÔNE-POULENC INC.

CN 7500, CRANBURY, NJ 08512-7500 TELEPHONE: (609) 860-4000

November 9, 1993

Tom Post U.S. EPA Project Coordinator U.S. EPA, Region 10 1200 Sixth Avenue, HW-104 Seattle, Washington 98101

Dear Mr. Post:

Subject:

Interim Measures Workplan

Rhône-Poulenc, Tukwila, Washington Facility

Administrative Order on Consent No. 1091-11-20-3008(h)

Enclosed are three copies of the Interim Measures (IM) Workplan for stabilizing the LNAPL at the Rhône-Poulenc, Tukwila, Washington Facility. The Work Plan has been prepared in accordance with the requirements of Administrative Order on Consent No. 1091-11-20-3008(h) as well as the letter from Mr. R. F. Smith dated September 15, 1993. As required by the Consent Order, copies of the Workplan are also being sent to Byung Maeng of the Washington Department of Ecology and Ade Bright of Fifer Environmental Associates.

Per the suggestion you made during our October 12 meeting, I have set aside November 30 and December 1 as possible meeting dates to discuss the IM Workplan and possibly the RFI Workplan. I understand you still need to confirm these dates with other members of your team. Please let me know as soon as you can so I can finalize my travel plans.

Please call me if you have any questions.

Sinceren

Edwin Liu

Project Manager

EL023/is

Enclosures (3)

cc:

Patt O'Flaherty/CH2M Hill

Byung Maeng/Washington Department of Ecology (one copy)

Ade Bright/Fifer Environmental Associates (one copy)

Draft Interim Measures Workplan

for

Rhône-Poulenc Inc.'s Marginal Way Facility Tukwila, Washington

Prepared for

U.S. Environmental Protection Agency Region 10

by

CH2M HILL

November 1993



CONTENTS

P	age
Introduction	1
Hydrogeology in the Vicinity of Monitoring Well MW-12	
The Presence and Character of the LNAPL	5
LNAPL Recovery Wells	6
LNAPL Recovery Methods	6
Characterization and Disposal of Recovered LNAPL	10
Progress Reporting	
References	
Appendix A. Technical Memorandum from CH2M HILL to Rhône-Poulenc Inc., September 9, 1993	
Appendix B. Well Logs	
Appendix C. LNAPL Characterization Report	
Appendix D. Auto-Skimmer™ Information from R.E. Wright Associates, Inc.	
FIGURES	
1 Vicinity Map	2
2 Estimated Extent of LNAPL in Upper Aquifer Groundwater	3
3 Schematic Diagram of the Product Recovery Filter (PRF) Installed in a Well	7
4 Schematic Diagram of the Tierra Madre 2SK2 Skimming Pump	9

SEA10026DA2.WP5

Introduction

This Interim Measures Workplan (IM Workplan) has been prepared for Region 10 of the U.S. Environmental Protection Agency (U.S. EPA) by Rhône-Poulenc Inc. (RPI). The Workplan addresses interim measures to be implemented as part of the Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) and Corrective Measures at RPI's Marginal Way Facility (the Facility) located in Tukwila, Washington (see Figure 1). The RFI and Corrective Measures are being conducted in accordance with the Administrative Order on Consent (Consent Order) No. 1091-11-20-3008(h) between U.S. EPA and RPI dated May 6, 1993.

The Facility was owned and operated by the Monsanto Chemical Company from 1947 to 1986, when it was purchased by RPI. The Facility was used for the manufacturing of vanillin (artificial vanilla) until RPI discontinued vanillin production in 1991. Since 1986 three investigations have been conducted at the Facility to evaluate the potential for environmental contamination that may have resulted from past industrial practices. These were a site assessment conducted for Monsanto by Dames & Moore in 1986, a RCRA Facility Assessment (RFA) performed for U.S. EPA in 1990, and an investigation conducted in 1991 by Landau Associates for a prospective purchaser of the Facility.

The past investigations have identified soil and groundwater contamination in various areas of the Facility. In the center of the Facility, in the vicinity of monitoring well MW-12, toluene has been detected in soil and groundwater and a light non-aqueous phase liquid (LNAPL) has been observed at the groundwater table. Monitoring well MW-12 was installed in August 1993 as a replacement well for Landau monitoring well G5; well G5 was abandoned at that time. The thickness of the LNAPL has been observed to be generally 1 to 2 feet thick as measured in monitoring well MW-12 and former monitoring well MW-G5. A rough approximation of the extent of LNAPL is shown in Figure 2; the actual extent is unknown and will be investigated during the RFI. More detailed information regarding the above-referenced Facility investigations, the conditions at the Facility, and the extent of soil and groundwater contamination there is provided in the Draft RFI Workplan (RPI, October 1993).¹

As required by the Consent Order, an Interim Measures Assessment Report (IM Assessment Report) was submitted to U.S. EPA (CH2M HILL, July 6, 1993).² The report evaluated the need for interim measures at the Facility, prior to initiation of the RFI. Following U.S. EPA's guidance, interim measures are implemented to "stabilize, control, or further limit releases from a RCRA facility and may be implemented at any point in the Corrective Action process where there is an immediate threat to human health or the environment."³

The IM Assessment Report recommended that the following interim measures be implemented at the Facility:

 Recovery of light nonaqueous phase liquid (LNAPL) from the vicinity of monitoring well MW-12

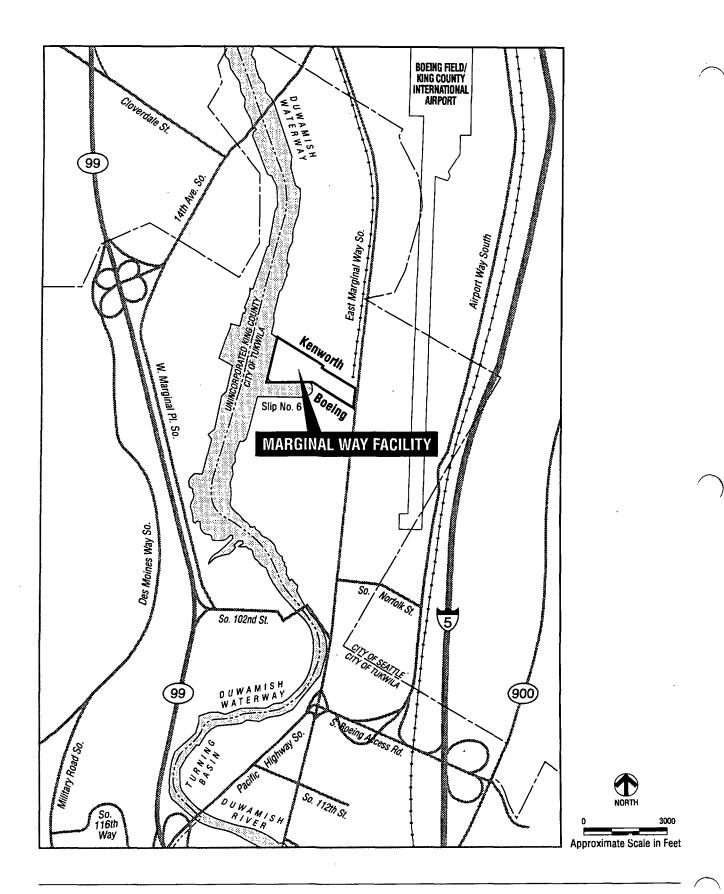
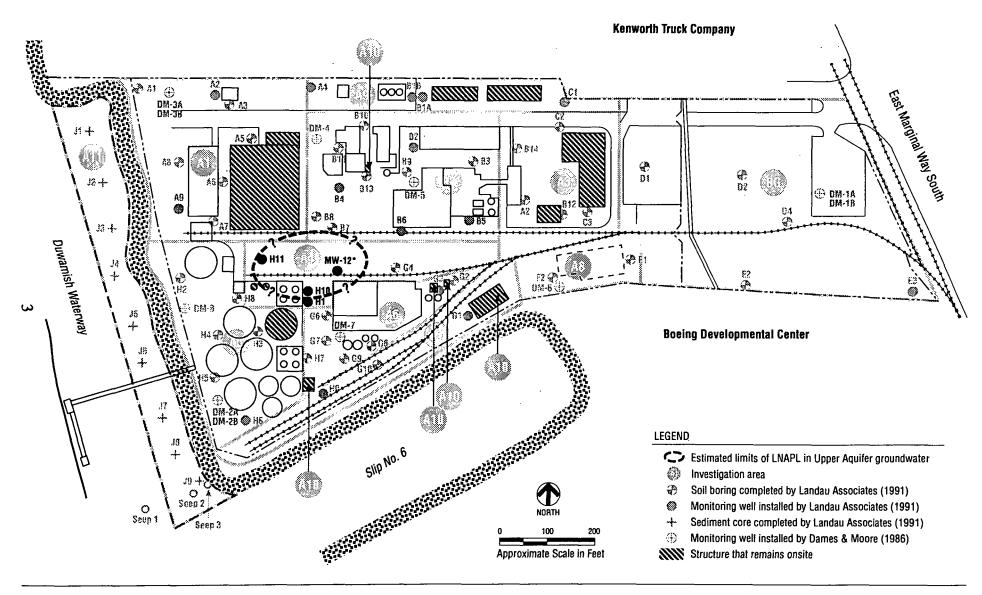


Figure 1 Vicinity Map



* Formerly Landau monitoring well G5

Figure 2
Estimated Extent of LNAPL in Upper Aquifer Groundwater

 Monitoring well rehabilitation to facilitate LNAPL recovery and prepare for the RFI

From July 1 to July 22, 1993, RPI completed the above-referenced monitoring well rehabilitation. This work is summarized in a Technical Memorandum (CH2M HILL, September 9, 1993), which was sent to U.S. EPA on September 10, 1993 as part of the monthly RFI Progress Report for August, and which is provided in this document as Appendix A.

U.S. EPA reviewed the IM Assessment Report and concurred that an interim measure to recover LNAPL was necessary. On September 15, 1993, U.S. EPA directed RPI to prepare a workplan identifying the methods that will be used to stabilize the LNAPL. This Workplan addresses the recovery of LNAPL in the vicinity of monitoring well MW-12 and includes the following elements:

- Hydrogeology in the vicinity of MW-12
- The presence and character of the LNAPL
- LNAPL recovery wells
- LNAPL recovery methods
- Disposition of recovered LNAPL
- Progress reporting

Hydrogeology in the Vicinity of Monitoring Well MW-12

The hydrostratigraphy of the (approximately) upper 100 feet at the Facility was described by Dames & Moore⁴ as a five-layer system. This five-layer model includes two aquifers, one unconfined and one confined. The five hydrostratigraphic units described by Dames & Moore are listed below (from top to bottom).

- Unsaturated Zone
- Upper Aquifer (unconfined)
- Upper Aquitard
- Lower Aquifer (confined)
- Lower Aquitard

Monitoring wells H1, H10, H11, and MW-12 are located in the immediate vicinity of the LNAPL. These wells are screened in the Upper Aquifer at varying depths. Borehole logs for these wells (presented in Appendix B of this document) indicate that the unsaturated zone (approximately 11 to 12 feet thick) is characterized by sand and silt, some of which is hydraulic fill from the Duwamish Waterway. Included in the lower portions of the unsaturated zone are low-permeability silt and clay beds. Infiltrating water may collect above these materials, creating perched groundwater conditions.

The Upper Aquifer consists of alluvial sands and silty sands. The Upper Aquifer is generally unconfined, its upper boundary defined by the water table present at a depth of approximately 11 to 12 feet below ground surface. Past soil borings indicate that the Upper Aquifer is laterally continuous beneath the site and is approximately 50 feet thick. Slug tests conducted at monitoring wells H10 and H11 in 1991 indicate that hydraulic conductivity of the Upper Aquifer at these locations is in the range of 10 to 100 feet/day.

The Presence and Character of the LNAPL

LNAPL has been observed in monitoring wells H10, MW-G5 (now abandoned), and MW-12 (the replacement for MW-G5). A sheen has also been observed in monitoring well H11. Observations made on September 29, 1993 indicate that there are approximately 2.1 inches of LNAPL in monitoring well H10. Before its abandonment in August 1993, the thickness of the LNAPL reported for MW-G5 ranged from less than 1 inch to as much as 28 inches. More recent measurements at replacement well MW-12 indicate an LNAPL thickness in the range of approximately 12 to 32 inches. The variable LNAPL thickness is believed to be caused by tidal influences.

LNAPL was collected from MW-G5 in July 1993, shortly before its abandonment, and the sample was analyzed by CH2M HILL's Applied Sciences Laboratory in Corvallis, Oregon. The analytical results indicate that the LNAPL is composed of approximately 82 percent Peneteck mineral oil and 11 percent toluene (density-corrected percentages). The total percentage accounted for does not add up to 100 percent; the remaining constituents are probably degradation products that were not identified or quantified as part of this analysis. The laboratory report is presented in Appendix C of this document. The properties of Peneteck and toluene are discussed below.

Peneteck. Peneteck mineral oil is a white, technical-grade, hydrocarbon mineral oil that was used in vanillin production. It is lighter than water with a specific gravity of approximately 0.8 at 60°F. The OSHA Permissible Exposure Limit (PEL) 8-hour Time Weighted Average (TWA) for mineral oil is 5 mg/M³ (RTECS, 1993). Peneteck has a low vapor pressure (less than 1 mm of mercury at 70°F) and is not expected to present an inhalation hazard under ambient conditions.

The fire danger posed by Peneteck is slight according to the National Fire Protection Association (NFPA) hazard identification system. The flash point of Peneteck is 265°F with an autoignition temperature above 600°F.

Toluene. Toluene is a colorless aromatic hydrocarbon with a characteristic odor. It is lighter than water with specific gravity of approximately 0.87 at 68°C, and it has an OSHA PEL 8-hour TWA threshold limit value of 100 ppm. Toluene has a high vapor pressure (28 mm of mercury at 77°F) and may present an inhalation hazard under ambient conditions.

The fire danger posed by toluene is high according to the NFPA hazard identification system. The flash point of toluene is 40°F with an autoignition temperature of 896°F.

LNAPL Recovery Wells

LNAPL will be recovered at monitoring wells MW-12 and H10 (Figure 2). MW-12 is a 4-inch-diameter well; H10 is a 2-inch-diameter well. Both wells are screened across the groundwater table. Geologic and well construction logs for these wells are provided in Appendix B.

As stated previously, well MW-G5 was abandoned in August 1993. It was a 2-inch-diameter well constructed with PVC casing and screen (see the well log in Appendix B). The well was abandoned for two reasons: (1) It was considered necessary to install a 4-inch-diameter well that would be more suitable for LNAPL recovery; (2) There was concern that the PVC screen or casing may have been damaged due to its prolonged contact with the toluene in the LNAPL. The PVC well casing and screen from MW-G5 were inspected upon extraction; the PVC felt slightly "tacky" but did not appear to be damaged by the prolonged contact with toluene in the LNAPL.

Well MW-G5 was abandoned by extracting the PVC casing and screen, over-drilling the existing borehole, and filling the over-drilled borehole with hydrated bentonite chips to within 3 feet of the surface. The remainder of the borehole was filled with concrete.

When the abandonment of MW-G5 was complete, monitoring well MW-12 was drilled approximately 8 feet west of the former MW-G5 location. MW-12 is constructed of 4-inch-diameter stainless-steel screen and casing, and is constructed in conformance with Washington State Regulations (WAC 173-160). A more detailed explanation of the well construction is presented in the Technical Memorandum (CH2M HILL, September 9, 1993) provided in Appendix A.

LNAPL Recovery Methods

Different equipment will be used to recover LNAPL at wells MW-12 and H10. Due to the limited thickness of LNAPL observed in well H10 (2.1 inches or less), a manual recovery system will be used at that well. An automated system will be installed at well MW-12 to allow continuous recovery of LNAPL. Upon approval of this IM Workplan, the specified product recovery equipment will be ordered and product recovery will begin within thirty (30) days. The recovery methods are discussed below in more detail.

Well H10. Recent measurements indicate that there may be a limited volume of LNAPL in the vicinity of well H10 compared to that observed near MW-12. LNAPL in well H10 will be collected with a Product Recovery Filter (PRF) manufactured by Billings Associates and shown in Figure 3. The PRF uses a hydrophobic filter membrane for passive separation of free-phase hydrocarbons and water. As can be seen in Figure 3, the PRF is similar to a bailer except that it contains a screened upper portion that includes the hydrophobic

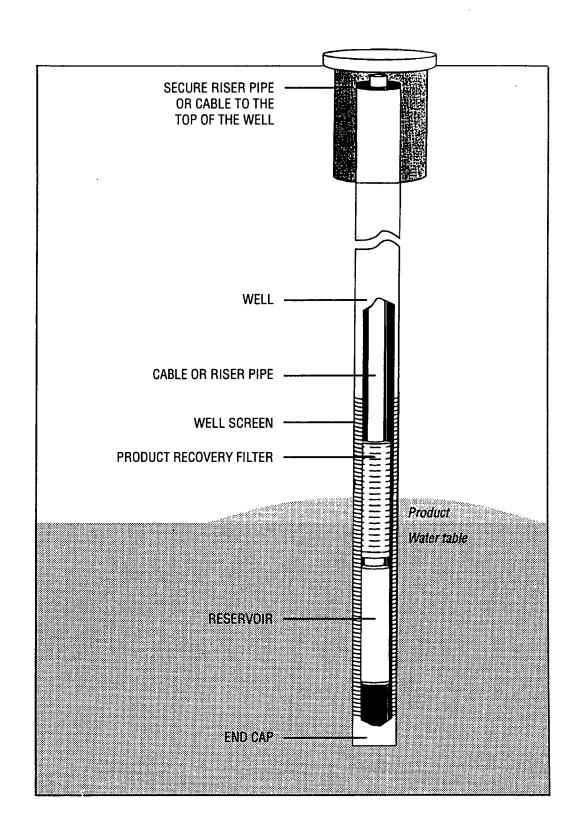


Figure 3
Schematic Diagram of Product Recovery Filter Installed in a Well

filter, which allows hydrocarbons to pass while keeping groundwater out. The PRF is suspended in the well such that the hydrophobic filter is in contact with the LNAPL. LNAPL passes through the filter and flows into a reservoir where it is held until it the device is emptied. The contents will be added to a portable tank located near MW-12 (see below).

The PRF will be emptied as necessary and the volume of LNAPL recovered will be recorded. If the LNAPL recovery rate or product thickness indicates that a continuous LNAPL recovery system would be appropriate for well H10, this alternative will be evaluated and discussed with U.S. EPA.

Well MW-12. The Tierra Madre 2SK2 Skimming Pump (supplied by Environmental Instruments Co., Concord, CA) will be installed in well MW-12 for continuous recovery of LNAPL. The Tierra Madre system is shown in Figure 4.

The Tierra Madre pump uses a hydrophobic filter to separate LNAPL from groundwater. As such, only LNAPL is recovered. The floating intake (see Figure 4) compensates for liquid-level fluctuations in the well. Therefore, it is well suited for use at sites where groundwater levels are tidally influenced. LNAPL is collected in a sump located below the floating intake and is pumped to a portable 500-gallon-capacity fiberglass tank at the ground surface using a conventional air-displacement pump located in the sump. A timer is used to automatically activate the pump on a schedule that can be set by the operator. The pump operates on compressed air supplied by a conventional electric air compressor. The recovery and storage system will be equipped with a sensor to automatically shut the system down when the storage tank nears capacity.

The recovery system will be checked daily, Monday through Friday. The volume of LNAPL recovered each day will be recorded. As indicated above, a portable fiberglass tank will be used to collect and contain the LNAPL. The tank will be enclosed within a secondary containment structure to protect against spills. When the aboveground tank begins to reach capacity (3/4 full), the disposal facility will be contacted to arrange for its disposal. The disposal facility will be a RCRA-permitted and RPI-approved Treatment, Storage, and Disposal (TSD) facility that will remove the contents with a vacuum truck.

Alternative Recovery Equipment for Well MW-12. Presently, RPI is completing a LNAPL recovery program at one of its other facilities in the eastern United States. A LNAPL recovery system called the Auto-Skimmer (manufactured by R. E. Wright Associates, Inc.) has been used successfully at that facility. Because the cleanup at the other facility is nearly complete, this equipment is expected to become available for use at well MW-12 at the Marginal Way Facility. If so, the Auto-Skimmer may be used instead of the Tierra Madre 2SK2 Skimming Pump (discussed above). The operation of the Auto-Skimmer is summarized below; further details are provided in Appendix D.

The R. E. Wright Auto-Skimmer is a mechanical system that recovers LNAPL from a top-filling bailer that is continuously lowered, raised, and emptied via a sophisticated

Wink

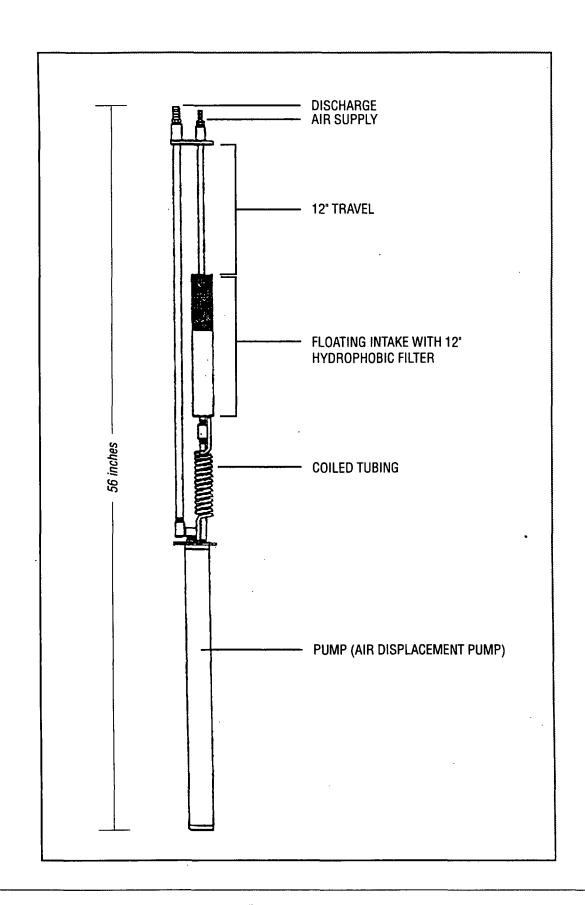


Figure 4
Schematic Diagram of the Tierra Madre 2SK2 Skimming Pump

cable-winch system. The system is automated and operates unattended. System operations are controlled by a series of timers that are set to maximize the recovery rate. Because the extent of bailer submergence is controlled in part by the buoyancy of the empty vessel, the Auto-Skimmer adjusts automatically to fluctuating groundwater table conditions. Recovered LNAPL is routed through an oil-water separator to separate any groundwater recovered with the LNAPL. After separation, the LNAPL and the water are directed automatically to separate holding tanks. These tanks will be equipped with a sensor to automatically shut the system down when the storage tank nears capacity.

Characterization and Disposal of Recovered LNAPL

The recovered LNAPL will be disposed of at a RCRA-permitted and RPI-approved TSD facility. At this time RPI has requested disposal quotations from Chemical Waste Management, Inc., and Laidlaw Environmental Services, Inc. Both of these facilities are RCRA-permitted, and they meet RPI's internal criteria for waste handling and disposal. For the facility selected, a waste profile and an LNAPL sample will be submitted for preapproval by the TSD.

A representative sample of the LNAPL was analyzed in detail by CH2M HILL's Corvallis, Oregon laboratory in August 1993, and CH2M HILL designated the LNAPL following Washington State's procedures for designating Dangerous Wastes (WAC 173-303-070). A copy of CH2M HILL's analytical report and its waste designation summary will be submitted to the selected TSD along with the waste profile.

At this time, RPI is directing that the recovered LNAPL be incinerated. This disposition could change if the selected TSD recommends a recycling facility that meets RPI's criteria.

Progress Reporting

The progress of the interim measures will be addressed monthly, and submitted as part of RPI's monthly RFI Progress Report to U.S. EPA. The following information will be included:

- Descriptions of the work completed and in progress
- The number of gallons of LNAPL recovered from each well (both current and cumulative figures)
- The volume and destination of LNAPL transported offsite

References

- 1. Rhône-Poulenc Inc. Draft RCRA Facility Investigation Workplan for the Marginal Way Facility, Tukwila, Washington. Prepared for U.S. EPA Region 10. October 1993.
- 2. CH2M HILL. Interim Measures Assessment Report for Rhône-Poulenc Inc.'s Marginal Way Facility, Seattle, Washington. Prepared for U.S. EPA Region 10, July 6, 1993.
- 3. U.S. EPA. Handbook, Stabilization Technologies for RCRA Corrective Actions. EPA/625/6-91/026, August 1991, p. 2.
- 4. Dames & Moore. *Phase II, Site Screening Investigation*. Prepared for Monsanto Chemical Company, Seattle, Washington, 1986.
- 5. National Institute for Occupational Safety and Health. Registry of Toxic Effects of Toxic Substances. 1993.

sea10026D7E.wp5

Appendix A

Technical Memorandum from CH2M HILL to Rhône-Poulenc Inc. September 9, 1993 TO:

Edwin Liu/Rhône Poulenc

FROM:

Patt O'Flaherty/CH2M HILL

PREPARED BY:

Blane Ebersold/CH2M HILL

Doug Holsten/CH2M HILL

DATE:

September 9, 1993

SUBJECT:

Monitoring Well Repairs and Development at the Rhône-Poulenc

Facility

Tukwila, Washington

PROJECT:

SEA35051.A3

This memorandum summarizes the well repair and development activities conducted at Rhône Poulenc's Tukwila, Washington facility between July 1 and August 2, 1993. Twenty-nine existing monitoring wells installed in 1986 and 1991 were inspected, repaired as necessary, and redeveloped to prepare them for use during the forthcoming RCRA Facility Investigation (RFI). Well MW-G5 was abandoned and monitoring well (MW-12) was installed and developed as a replacement.

Summary

The following wellhead repairs and modifications were completed:

- Four existing monitoring wells (DM-4, A-9, DM-7, and H-9) previously covered with asphalt or fill were located with a backhoe prior to making wellhead modifications.
- Wellheads for six existing monitoring wells (DM-2A, DM-2B, DM-5, B-2, B-4, and H-6) were converted from flush completions to above-ground completions.
- Flush wellhead completions for ten existing monitoring wells (DM-3A, DM-3B, DM-4, DM-5, DM-7, A-9, G-3, H-1, H-9, and H-10) were raised by 3 to 8 inches.
- Wellhead monuments were repaired for four other wells without changing surrounding grade.
- One 2-inch diameter PVC monitoring well (MW-G5) was abandoned and replaced with a 4-inch diameter stainless-steel monitoring well (MW-12).
- All thirty wells at the facility were developed by surging and pumping.

MEMORANDUM

Page 2 September 9, 1993

> Prior to development, 14 shallow wells were monitored for visible LNAPL,
> "black water," and stratification using a 28-foot clear bailer provided by Rhône-Poulenc.

Well modifications, abandonment, drilling, and redevelopment were conducted by Tacoma Pump and Drilling, Inc. under the direction of CH2M HILL. A summary of repair work completed at each well is presented in Table 1. Additional information is provided below.

Conversion of Wellheads to Above-Ground Completions

Wellheads for wells DM-2A, DM-2B (DM-2A and DM-2B nested wells with a single wellhead structure), and H6 were converted from flush completions to above-ground completions. These wells are located in the former tank farm where rain water tends to pond on the asphalt pavement. The new completions consist of 12-inch diameter protective steel casing with a locking lid. The top of the steel casing was left approximately 3 feet above surrounding grade.

Because Rhône-Poulenc anticipates that grades will be raised in certain areas of the site in the near future, three wellheads originally scheduled to remain as flush completions were modified to above-ground completions. Wellheads for wells B-2, B-4, and DM-5 were extended 2 to 3 feet above grade using 8-inch diameter steel casing. Conventional flush-completion wellhead monuments were installed at the top of the steel casing. This will allow these wells to be easily modified to flush completions at a later date after grade changes have been made. The 8-inch diameter casing can be cut or extended as necessary to allow the flush-completion monuments to match final grades.

Raising Elevation of Flush Completions

Ten flush completion wells were raised several inches to minimize the opportunity for surface water to flood the wellheads and enter the wells. Wellheads for the following wells were raised approximately 3 to 8 inches depending on location: (DM-3A, DM-3B, DM-4, DM-5, DM-7, A-9, G-3, H-1, H-9, and H-10).

Location of Previously Covered Wells

Four wells (DM-4, A-9, DM-7, and H-9) had been previously covered by soil or asphalt and could not be located. All four wells were exposed using a backhoe and the wellheads were raised and repaired as needed.

Evaluating Groundwater Stratification in Shallow Wells

Fourteen shallow wells were monitored for the presence of "layering" using a 28-foot clear bailer provided by Rhône-Poulenc. The monitoring focused on identifying (1) the presence/absence of NAPL, (2) the presence/absence of "black water," and (3) any

MEMORANDUM Page 3 September 9, 1993

apparent stratification of the black water where it was present. All wells were monitored prior to well development.

Abandonment and Replacement of Monitoring Well G5

Monitoring well MW-G5 was abandoned on July 21, 1993. This was accomplished by (1) pulling the well casing from the borehole, (2) over-drilling the original borehole with a hollow-stem auger drill rig, and (3) backfilling the newly created borehole with bentonite chips. The bentonite chips were installed in three-foot lifts. Each lift was hydrated with potable water to seal the borehole.

Well MW-12 was drilled to replace MW-G5. MW-12 was drilled approximately 8 feet west of the former location of MW-G5. The new well was installed to a depth of 19 feet with a screened interval of 9 to 19 feet from the ground surface. The final measured depth of MW-12 after development was 18.41 feet from the top of casing (the top of casing is approximately 6 inches below ground surface). The geologic and well construction log for MW-12 is attached.

All cuttings generated during abandonment of monitoring well MW-G5 and from installation of MW-12 were placed in three 55-gallon drums to be held for analysis and selection of an appropriate disposal method. Composite samples were collected from the three drums and submitted for laboratory analysis on August 2, 1993. Laboratory results and cuttings disposal will be addressed in a future memorandum.

Well Development

Twenty-nine monitoring wells were redeveloped and well MW-12 was developed for the first time. The total volume of water purged from the monitoring wells was approximately 2,800 gallons. Table 2 summarizes pre-development and post development well depths (as measured by CH2M HILL), screen intervals, and pertinent data collected during well development. Purge water was retained in temporary storage tanks and analyzed for toluene. The development water was found to meet the discharge requirements of Rhône Poulenc's METRO permit. The water was subsequently discharged to the METRO sewer system by Rhône Poulenc personnel.

Table 1 Monitoring Well Repair Summary

Monitoring Well	Summary of Repairs
DM-1A*	Redevelopment
DM-1B*	Redevelopment
DM-2A*	Converted to above-ground completion, redevelopment
DM-2B*	Converted to above-ground completion, redevelopment
DM-3A*	Raised flush completion, installed new protective casing, redevelopment
DM-3B*	Raised flush completion, installed new protective casing, redevelopment
DM-4	Located well under asphalt, raised flush completion, installed new protective casing, redevelopment
DM-5	Located well under asphalt, converted wellhead to above-ground completion, redevelopment
DM-6	Redevelopment
DM-7	Located well under asphalt, raised flush completion, installed new protective casing, redevelopment
DM-8	Repaired flush completion, redevelopment
A-2	Raised flush completion, redevelopment
A-4	Redevelopment
A-9	Located well under asphalt, raised flush completion, redevelopment
B-1A	Redevelopment
B-1B	Redevelopment
B-2	Converted wellhead to above-ground completion, redevelopment
B-4	Converted wellhead to above-ground completion, redevelopment
B-5	Redevelopment
B-6_	Redevelopment
C-1	Redevelopment
E-3	Redevelopment
G-1	Redevelopment
G-3	Raised flush completion, installed new protective casing, redevelopment
MW-12 **	Drilled new well, new protective casing, development
H-1	Raised flush completion, redevelopment
H-6	Converted to above-ground completion, redevelopment
H-9	Raised flush completion, installed new protective casing, redevelopment
H-10	Raised flush completion, installed new protective casing, redevelopment
H-11	Redevelopment

^{*} denotes dual-completion well **MW-12 replaced MW-G5

Table 2
Monitoring Well Development Summary

Monitoring Well	Well Diameter	Well Construction Material	Measured Total Well Depth (ft.) (reported by Landau and Dames & Moorel	Screened Interval from TOC (ft.) [reported by Landau and Dames & Moore]	Measured Total Well Depth (ft.) [before development]	Measured Total Well Depth (ft.) [after development]	Average Development Flow Rate (gpm)	Total Volume Purged (gal)	Development Time (min.)	Final Temperature (deg. Centigrade)	Final pH	Final Conductivity
DM-1A*	2	PVC	27.00	7 to 27	27.10	27.10	1.7	115	65	16.2	7.4	300
DM-1B*	2	PVC	103.00	97 to 103	101.50	102.75	1.3	240	190	17	8.8	700
DM-2A*	. 2	PVC	29.00	. 11 to 31	31.15	31.15	2	45	46	17.7	8.7	3,950
DM-2B*	2	PVC	94.00	86 to 96	94.54	96.12	2.3	80	39	14.8	8.6	1,050
DM-3A*	2	PVC	27.10	7 to 27	26.78	26.78	1.5	80	55	15.2	7.0	340
DM-3B*	2	PVC	95.30	85 to 95	92.90	95.70	4.5	470	105	13.5	8.7	1,300
DM-4	2	PVC	36.10	16 to 36	34.92	35.43	2	120	80	16.7	7.0	650
DM-5	2	PVC	36.00	16 to 36	37.67	37.67	2.2	110	50	16.1	7.2	2,900
DM-6	2	PVC	27.00	7 to 27	27.63	27.63	2	65	45	14.9	7.4	300
DM-7	2	PVC	29.80	10 to 30	29.48	29.53	2	115	58	16	7.2	780
DM-8	2	PVC	36.20	16 to 36	35.72	35.72	2	55	35	16.5	6.9	1,450
A-2	2	PVC	21.50	11.5 to 21.5	21.95	22.25	0.5	47	100	15.5	7.6	620
A-4	2	PVC	20.00	10 to 20	19.96	20.00	0.5	30	119	15.9	7.0	420
A-9	2	PVC	21.50	11.5 to 21.5	20.24	20.45	0.4	24	60	18.1	7.3	240
B-1A	2	PVC	16.70	6.7 to 16.7	16.70	16.70	0.2	15	110	20.4	7.3	230
B-1B	2	PVC	97.10	87.1 to 97.1	97.24	97.20	1.4	150	• 110	14.2	8.9	850
B-2	. 2	PVC	22.20	15.4 to 25.4	23.36	25.36	0.3	4	80	16.3	8.5	620
B-4	2	PVC	53.70	46.7 to 56.7	56.64	56.69	0.2	250	125	16.5	8.1	1,700
B-5	2	PVC	22.70	17.7 to 22.7	23.05	23.10	1.5	145	95	14.6	7.2	550
B-6	2	PVC	23.00	13 to 23	23.02	23.32	0.3	45	135	19.5	8.5	950
C-1	2	PVC	23.00	13 to 23	22.50	22.80	0.8	125	155	15.6	7.1	280
E-3	2	PVC	23.00	13 to 23	22.17	22.20	0.4	65	159	15.8	7.6	280
G-1	2	PVC	20.00	10 to 20	19.92	19.98	0.3	15	45	16	7.1	650
G-3	2	PVC	19.70	9.7 to 19.7	20.05	20.08	0.4	15	40	15.5	7.7	380
MW-12 **	4	Stainless Steel	19.00	9 to 19	17.80	18.41	0.3	130	385	21.7	7.4	1,050
H-1	2	PVC	55.00	45 to 55	56.02	56.02	0.7	67	95	20.3	7.8	230
H-6	2	PVC	20.00	12 to 22	21.88	22.00	0.2	15	85	19.1	8.3	2,050
H-9	2	PVC	19.30	10.3 to 19.3	19.80	20.04	0.75	50	125	15.9	8.2	1,300
H-10	2	PVC	20.00	10 to 20	19.94	19.94	0.5	48	95	15.8	7.7	650
H-11	2	PVC	20.00	10 to 20	19.82	19.92	0.5	40	83	16.4	7.2	1,700

^{*} denotes dual-completion well **MW-12 replaced MW-G5

Total Volume Purged =

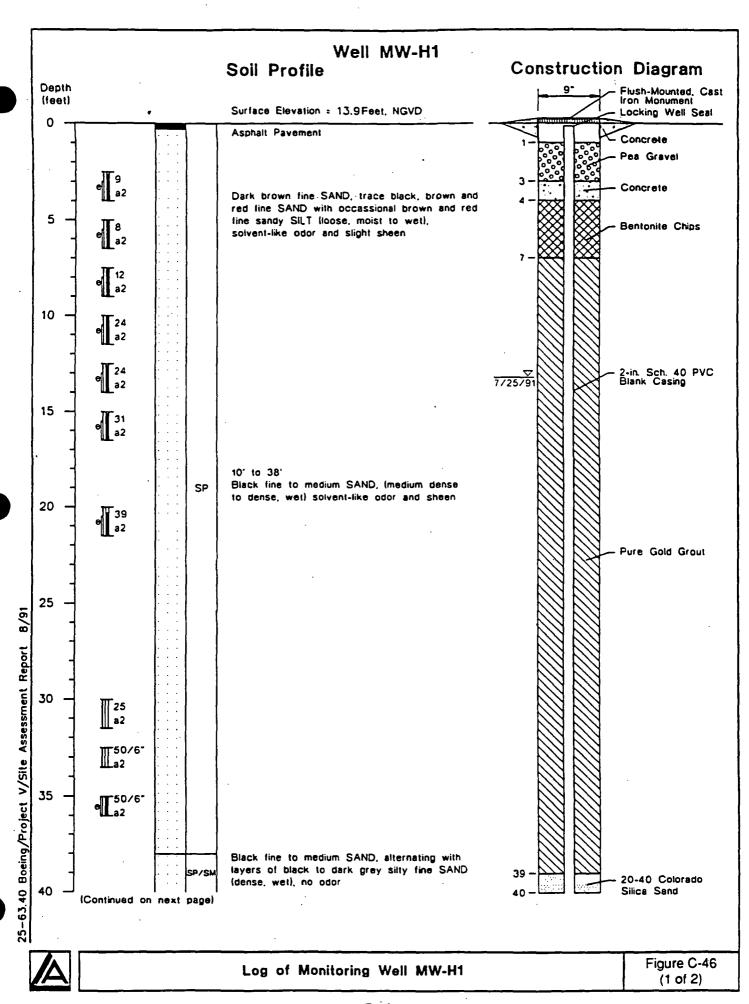
MONITORING WELL GEOLOGIC & CONSTRUCTION LOG

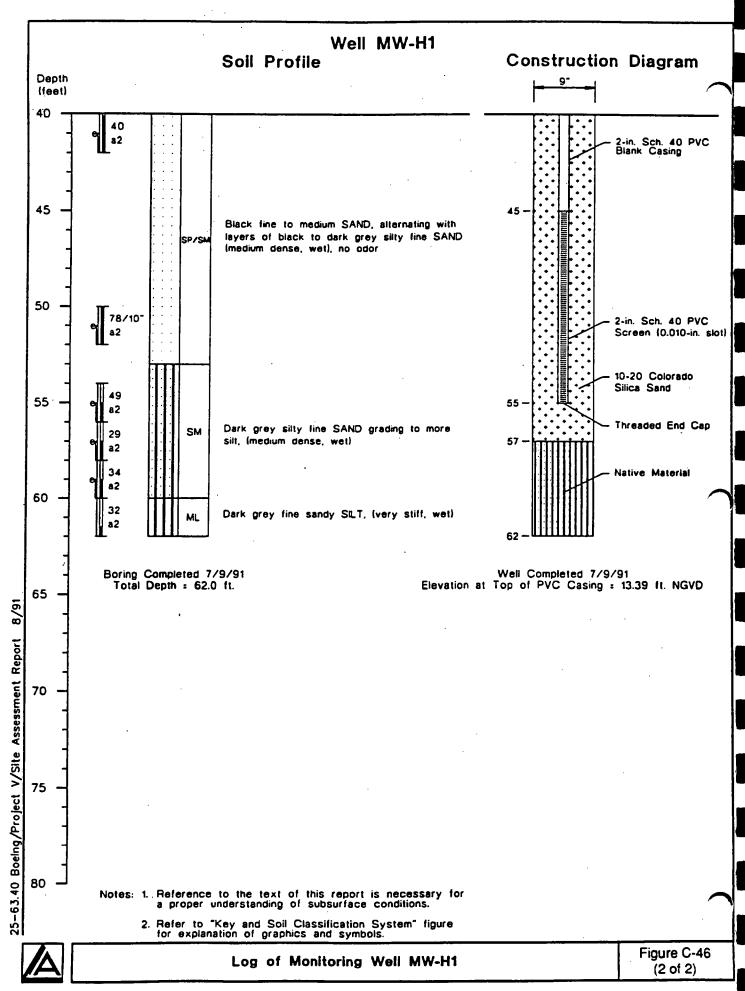
PROJECT NUMBER SEA35051.A3 WELL NUMBER MW-12

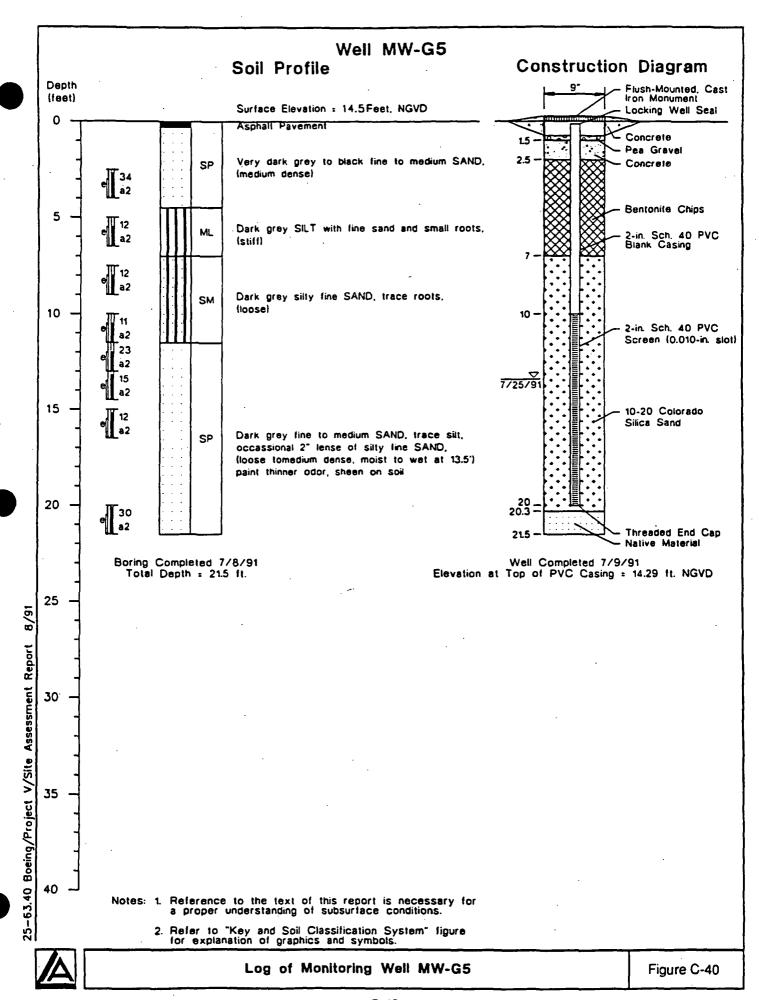
SHEET 1 OF 1

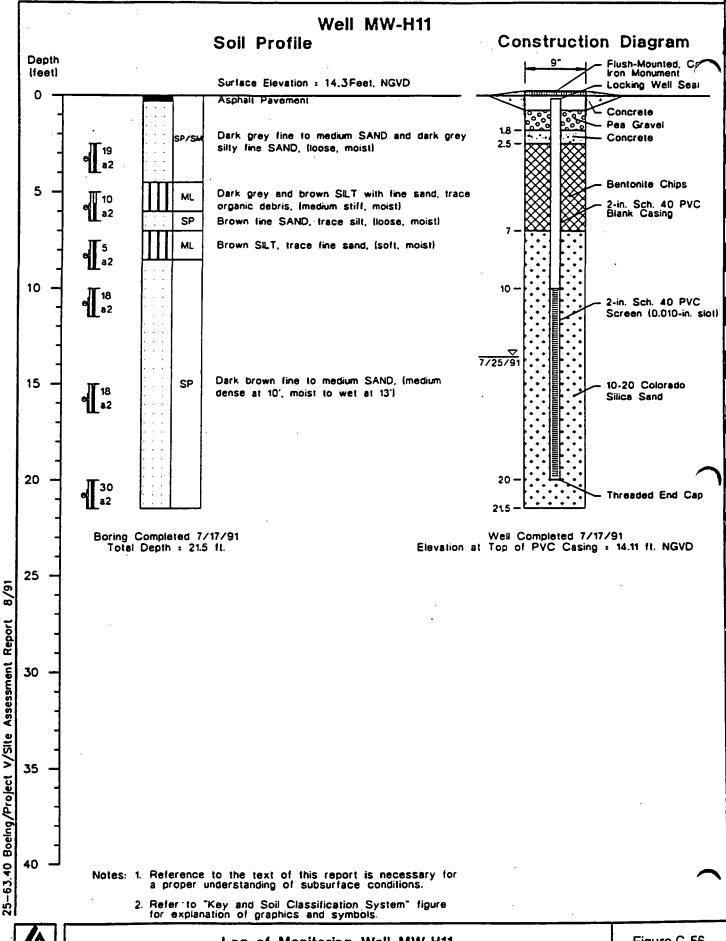
RHONE POULENC, INC. EAST MARGINAL WAY, TUKWILA, WA PROJECT LOCATION **ELEVATION (TOP OF WELL CASING)** SURFACE ELEVATION WATER LEVEL ELEVATION 16.2 FT. BELOW TOP OF CASING 8/28/93 JULY 21, 1993 START DATE **JULY 21, 1993** TACOMA PUMP AND DRILLING, INC. DRILLING CONTRACTOR FINISH DATE D. KUNKEL DRILLING METHOD HOLLOW-STEM-AUGER, MOBILE DRILL B-61 HYDROGEOLOGIST WELL CONSTRUCTION USCS DESIGNATION RECOVER BLOWCOUNT NTERVAI **GEOLOGIC LOG &** 12-INCH DIAMETER STEEL PROTECTIVE MONUMENT FIELD OBSERVATIONS AND WATERTIGHT CAP CONCRETE SURFACE SEAL SAND FOR DRAINAGE POORLY-GRADED SAND (SP): Black to dark grey medium 10-9-9 4-INCH DIAMETER TYPE 2.5-4.0 sand, moist, medium dense, fill material SP 304 STAINLESS STEEL 1.3 FLUSH-THREADED WELL CASING POORLY-GRADED SAND WITH GRAVEL (SP): Greybrown from 5.0 to 5.2 ft. bgs, wet, medium dense HYDRATED BENTONITE SP 10-7-8 CHIPS POORLY-GRADED SAND (SP): Dark grey from 5.2 to 5.0-6.5 1.5 5.8 ft. bgs, wet, medium dense ML SILT WITH SAND (ML): Dark grey from 5.8 to 6.5 ft. bgs, moist, medium dense, some wood debris and rootlets SHNCH NOMINAL DIAMETER BOREHOLE SILTY SAND (SM): Grey brown fine to medium sand, 6-6-8 SM 7.5-9.0 moist, medium dense, interbedded with grey-brown silt 1.5 layers approximately 3 inches thick, layers are indistinct 20-40 CSSI RAND FILTER PACK 10 POORLY-GRADED SAND WITH SILT (SP-SM): Mottled SP-SM 10.0-9-6-6 brown-dark grey from 10 to 10.8, moist, medium dense CL CLAY (CL): Brown, moist to wet, from 10.8 to 11.5, plastic, stiff POORLY-GRADED SAND (SP): Dark grey medium sand, 10-7-6 12.5-SP 20-SLOT, 4-INCH wet, medium dense, toluene odor 14.0 1.4 DIAMETER, FLUSH-THREADED STAINLESS STEEL WELL SCREEN 15 15.0-12-0-7 POORLY-GRADED SAND (SP): Dark grey medium sand, SP 18.5 1.5 wet, medium dense, toluene odor 17.5-0-8-10 POORLY-GRADED SAND (SP): Dark grey medium send, SP 18.0 1.5 wet, medium dense, some 1-inch diameter rounded gravel, 4-INCH DIAMETER. toluene odor FLUSH-THREADED, STAINLESS STEEL 20 20 END CAP POORLY-GRADED SAND (SP): Dark grey medium sand, 20.0-10-9-12 wet, medium dense, some 1-inch diameter rounded gravel, 1.Б 21.5 toluene odor

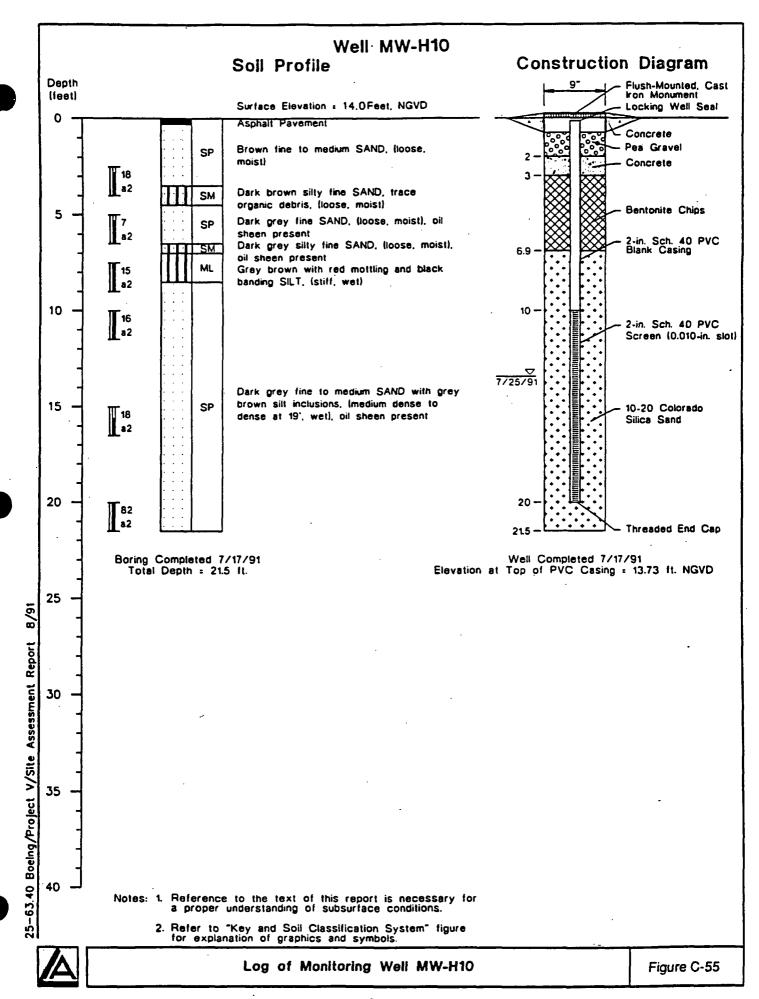
Appendix B
Well Logs











MONITORING WELL GEOLOGIC & CONSTRUCTION LOG

PROJECT NUMBER SEA35051.A3

WELL NUMBER
MW-12

SHEET 1 OF 1

PROJECT RHONE POULENC, INC.

ELEVATION (TOP OF WELL CASING)

WATER LEVEL ELEVATION
DRILLING CONTRACTOR
DRILLING CONTRACTOR
DRILLING METHOD

HOLLOW-STEM-AUGER, MOBILE DRILL B-61

LOCATION
EAST MARGINAL WAY, TUKWILA, WA

SURFACE ELEVATION
START DATE
JULY 21, 1993
HOLLOW-STEM-AUGER, MOBILE DRILL B-61

HYDROGEOLOGIST
D. KUNKEL

DRILLING N	VETHO		HOLLOW-STEM-AUGER, MOBILE DRILL B-61 HYDROG	EOLOGI	ST D. KUNKEL
ДЕРТН (Р.)	INTERVAL	BLOWCOUNT AND RECOVERY	GEOLOGIC LOG & FIELD OBSERVATIONS	USCS	WELL CONSTRUCTION 12-INCH DIAMETER STEEL PROTECTIVE MONUMENT WATERTIGHT CAP
_ _ _	2.5-4.0	10-9-9	POORLY-GRADED SAND (SP): Black to dark grey medium sand, moist, medium dense, fill material	SP	CONCRETE SURFACE SEAL SAND FOR DRAINAGE 4-INCH DIAMETER TYPE ————————————————————————————————————
5 5	5.0-6.5	1.3 10-7-8 1.5	POORLY-GRADED SAND WITH GRAVEL (SP): Greybrown from 5.0 to 5.2 ft. bgs, wet, medium dense POORLY-GRADED SAND (SP): Dark grey from 5.2 to 5.8 ft. bgs, wet, medium dense SILT WITH SAND (ML): Dark grey from 5.8 to 6.5 ft. bgs,	SP ML	FLUSH-THREADED WELL CASING HYDRATED BENTONITE 5 — CHIPS
_ _ _ _ 10	7.5-9.0	1.5	moist, medium dense, some wood debris and rootlets SILTY SAND (SM): Grey brown fine to medium sand, moist, medium dense, interbedded with grey-brown silt layers approximately 3 inches thick, layers are indistinct POORLY-GRADED SAND WITH SILT (SP-SM): Mottled	SM	9-INCH NOMINAL DIAMETER BOREHOLE 20-40 CSSI SAND PILTER PACK
_	10.0-	9-8-8 1.5 10-7-6	brown-dark grey from 10 to 10.8, moist, medium dense CLAY (CL): Brown, moist to wet, from 10.8 to 11.5, plastic, stiff POORLY-GRADED SAND (SP): Dark grey medium sand,	SP-SM CL SP	20-SLOT, 4-INCH
15 15	15.0- 16.5	1.4 12 -9- 7 1.5	wet, medium dense, toluene odor POORLY-GRADED SAND (SP): Dark grey medium sand, wet, medium dense, toluene odor	SP	DIAMETER, FLUSH- THREADED STAINLESS STEEL WELL SCREEN -
	17.5- 19.0	10-9-10 1.5	POORLY-GRADED SAND (SP): Dark grey medium sand, wet, medium dense, some 1-inch diameter rounded gravel, toluene odor	SP	4-INCH DIAMETER, PLUSH-THREADED, STAINLESS STEEL
20	20.0- 21.5	10-8-12 1.5	POORLY-GRADED SAND (SP): Dark grey medium sand, wet, medium dense, some 1-inch diameter rounded gravel, toluene odor	SP	END CAP 20 ———————————————————————————————————

Appendix C LNAPL Characterization Report



August 25, 1993

Mr. George S Goodridge Senior Environmental attorney Rhone-Poulenc, Inc. CN 5266 Princeton, NJ 08543-5266

Dear Mr. Goodridge,

On May 26, 1993, the CH2M HILL Corvallis Applied Sciences Laboratory received one sample with a request for evaluation of chemical composition.

The analytical results are enclosed. Associated data included to Sue Hays and Pat O'Flaherty only. Any unusual difficulties encountered during the analysis of this sample are discussed in the case narrative.

Under CH2M HILL policy, your samples will be stored for up to 30 days after results are reported. If prior instructions have not been given for disposal, your organization will be contacted at that time for instructions.

CH2M HILL appreciates your business and look forward to serving your analytical needs again. If you should have any questions concerning the data, of if you need additional information, please call me directly, at (503) 752-4271.

Sincerely

Kelly E. Cook

Environmental Scientist

œ:

Sue Hays/Rhone-Poulenc

Edwin Liu/Rhone-Poulenc

Pat O'Flaherty/CH2M HILL/SEA

Enclosures

Corvallis Applied Sciences Laboratory

Client Information

Project Name: Rhone-Poulenc Project Manager: Pat O'Flaherty Sampled By: Tim O'Conner

Client Sample ID: RPGW5
Sampling Date: 5/25/93

Sampling Time: 14:30 Type: Grab

Matrix LNAPL Basis: As Rec'd.

Lab Information

Date Rec'd: 5/26/93

Batch ID: 528704

Dilution Factor: 1

Report Revision No.: 1

Reported By: K. Cook Reviewed By: K. Sanders

Analyte	Reporting Limit	Sample Result	Qualifier	Units	Method	Date Analyzed
Palatinol DOP	500	86	J	mg/l	GC/FID	7/26/93
Palatinol 711	500	460.0	JN	mg/l	GC/FID	7/26/93
Santicizer 148	500	ND	U	mg/l	GC/FID	7/26/93
Toluene	500	90,090		mg/l	GC/FID	7/26/93
White Mineral Oil (Peneteck)	500	665,000		mg/l	GC/FID	7/26/93
Specific Gravity	0.005	0.815		g/cc	Gravimeteric	8/18/93

Density Corrected Values

 Toluene
 11.1%

 Peneteck
 81.6%

 Total
 92.7%

N=Unconfirmed Identity

ND=Not Detected

U=Not detected at specified detection limits

J=Estimated value

T=Exceeded holding time

Corvallis Applied Sciences Laboratory

Client Information

Project Name: Rhone-Poulence

Project Manager: Pat O'Flarity
Sampled By: Tim O'Conner

Client Sample ID: RPGW5

Sampling Date: 5/25/93

Sampling Time: 14:30 Type: Grab Matrix LNAPL

Basis: As Rec'd.

Lab Information

Date Rec'd: 5/26/93

Batch ID: 528704

Dilution Factor: 1 Report Revision No.: 0

Reported By: K. Cook

Reviewed By: K. Sanders

Analyte	Reporting Limit	Sample Result	Qualifier	Units	Method	Date Analyzed
Palatinol DOP	500	86	J	mg/l	GC/FID	7/26/93
Palatinol 711	500	460.0	<u> ۱ ۸</u>	mg/l	GC/FID	7/26/93
Santicizer 148	500	-500:0 NI) U	mg/l	GC/FID	7/26/93
Toluene	500	90.090		mg/l	GC/FID	7/26/93
White Mineral Oil (Peneteck)	500	665,000		mg/l	GC/FID	7/26/93
Specific Gravity	0.005	0.815		g/cc	Gravimeteric	8/18/93

Density Corrected Values

Toluene 11.1%
Peneteck 81.6%
Total 92.7%

N= Unconfirmed identity ND= Not Detected

U=Not detected at specified detection limits

J=Estimated value

T=Exceeded holding time

ORGANIC DATA QUALIFIERS

- U Indicates the compound was analyzed for, but not detected. The number adjacent to the "U" qualifier indicates the reporting limit for that compound. The reporting limit can vary from sample to sample depending on dilution factors or percent moisture adjustments when indicated.
- J Indicates an estimated value. It is used when the data indicates the presence of a compound below the stated reporting limit.
- C This flag applies to GC analytes only. The "C" flag indicates the presence of this compound has been confirmed by GC/MS analysis.
- B This flag is used when the analyte is found in the associated blank, as well as the sample. This notation indicates possible blank contamination and suggests the data user evaluate these compounds and their amounts carefully.
- E This qualifier indicates that the value reported exceeds the linear calibration range for that compound. Therefore, the sample should be re-nalyzed at an appropriate dilution. The "E" qualified amount is an estimated concentration, and the results of the ilution will be reported on a separate form.
- D This qualifier indicates compounds which have been identified during a diluted renalysis. "D" qualifiers are used for samples that have been analyzed initially at a lesser dilution than required for accurate quantification.

NARRATIVE

Preliminary Evaluation

The sample received and assigned reference no. 528704 was initially designated as LNAPL (light, non-aqueous petroleum liquid), and subsequently identified as RPGW5 (product) on the sample chain of custody. Three other samples were received with this sample as reference materials for possible use as analytical standards for quantification.

Initial evaluation of the sample was to determine a method of analysis for the presence and possible quantitation of specific organic compounds. The method chosen for evaluation of the sample is capillary gas chromatography using a flame ionization detector. The capillary column gives excellent separation of complex mixtures and the flame ionization detector is considered to be almost universal for the detection of hydrocarbon mixtures. The method of analysis was found to be very effective for this sample, and initial screening revealed a complex mixture of hydrocarbons with a very distinctive fingerprint. The initial chromatograms are included in the appendix under "PRELIMINARY DATA".

This preliminary information showed the presence of toluene at approximately 10% of the total sample. The three chemicals accompanying the sample were also chromatographed and eliminated as major components. Several other compounds were named as possible components (gasoline, diesel, and stoddard solvent) and were also chromatographed. None of the characteristic fingerprints matched the sample and all were eliminated as major components.

Qualitative and Quantitative Analysis

The preliminary evaluation showed the method to be adequate for the quantitative analysis of the sample. The analysis proceeded to quantify toluene and the three other chemicals initially sent with the sample. A sample of white mineral oil (Peneteck) was also evaluated at this time as a possible constituent. The chromatograms are included in the appendix under "QUANTITATIVE DATA". The diluted sample was also sent to our Redding California laboratory for qualitative analysis using gas chromatography/mass spectroscopy for identification of compounds present. The results of the analysis is included as a separate report following this document in the appendix under "QUALITATIVE DATA". The report verifies toluene as a major component and identifies the remainder as a mix of complex hydrocarbons, typical of mineral oil components. The compound bis(2-Ethylhexyl)phthalate is also identified as being present at an estimated level of 50 mg/l. This is the same as Palatinol DOP, reported at 86 mg/l in the quantitative report.

The fingerprint of the mineral oil sample was a very close match to the sample and was quantified with the other compounds during the analysis as a major constituent of the sample. Small amounts of two of the three initially suspected chemicals were found at levels below the lowest standard used and can only be reported as estimates.

The total percentage accounted for does not add up to 100 percent. This is not unusual when dealing with samples of this nature since this is a complex mixture which has been subjected to environmental influences of change. Many of the peaks seen in the sample are possibly degradation products and were not identified or quantified as part of this analysis and probably makeup the remaining percentage.

Results are reported on an as received basis unless otherwise noted in the reports.

CLIENT SAMPLE CROSS-REFERENCE

CH2M HILL APPLIED SCIENCES LABORATORY

Client	CVO Lab
Sample ID	Sample ID
5/25 Palatino1-711	528701
5/25 Saniticizer-148	528702
5/25 Palatino1-DOP	538703
5/25 RPGW5	538704

CHM HILL

QUALITY ANALYTICAL LABORATORIES	CHA	N (OF C	USTO	DY RE	CORE	ANE) AGF	REEMENT	T TO PE	RFOF	RM SERV	ICES		
CH2M HILL Project # . Purchase Order #						LA	B TEST	CODE	S			SHADEC	AREA FOI	R LAB USE	ONLY
SEA3505LSALL												Lab 1#	a) (1)	Lab 2#	
Project Name					{ {		·			Ì		528	701-74		
RHONE - Poulenc	_	#										Quote #		Kit Request	
Company Name/CH2M HILL Office		0		1		1				- {					
(+)2M 1/11 (SFA)		F	ļ	l	Ll			اا			<u> </u>				
Project Manager & Phone # Report Copy to:			 -)	·	ANA	LYSES	REQUE	STED	1		Project #			
Ms. M. PAT D'FLACIM		C		ļ						į					
	npie Disposal:	N	}	}		}				1	!	No. of Samp	oles	Page	of
SOWA NPDES ACRA OTHER DIS	pose Return	À	ļ								:		4	1	1.2
Type Matrix	<u></u>	N								1	i	COC Rev	Login	LIMS Ver	Ack Gen
Sampling CIGWIS CHENT SAMPLE	ID	AS					i) 	}			
Sampling C G W S CLIENT SAMPLE (9 CHARACTER)	S)	3		1]						i		MARKS	LAB 1	LAB 2
Date Time PBEL	, , , , , , , , , , , , , , , , , , , 	 -		 	ļ!						 	 		ID ID	ID
15/25/14:30 NN MILITARY 71	{										1	PLASIK	itter	+1	1
15/25/24/30 XX SANITYCAZAZ	148	1	l				 					` '		12	ļ
5/25/11/4:30 XX PAGATINOL	DOP	1					!					11	·	3	
]]														
			ļ					<u> </u>		i	!	1			
	1 1 1	ĺ	}	Ì	1	}		ļ].		}			1
									}		į	j	•	1	{
	1 1 1	1	ļ						l···	1	1)		}	ł
		ŀ	į	1	ł			Ì	, ,	1	:				{
	1 1 1	1]			İ		1	} }		i	}		}	}
	1 1 1		}	1	}				1 1	į					1
	1 1	1	\					Ì	}	İ	i	1			}
Southing By Mille (Peace sign and pilin name) HYDAOLFONY,	Date/Time	<u>'</u> '30	Refu	quished	mm	TIM	algn agd r	orine name)			Daye/T	45 15.00	HAZWRAP/NE	<u> </u>	ii
Acceived By (Please sugn and print name)	Date/Time		Relin	quished	By	Ploase	E. E.S.	orini Hame)			Date T	inie	QC Level: (1)	2 3 Other	1
Jim Maylick.	126-13	41	17	·					·····			,	COC Rec [/	ICE +A	
Received By (Please sign and print name)	Date/Time		Relin	dayspeq ,	Ву	(Please	a sign and p	orins name)		•	Date/T	J-	Ana Req) TEMPL	
Received By (Please sign and print name)	Date/Time		Shipp	ed Via						Shippi	94.		Cust Seal	\ Ph	
			UPS	BUS	Fed	·Èr	Hand	Other		- 1 / -	101	81550	3)		
Work Authorized By (Please sign and print name)	Remarks					`)	
Instructions Agreement Provisions on Revers	e Side					<u> </u>					TRIB	USORIG	LAB.	HOW - LAB.	mx - Clien
managions yagroomen revision of															

CHM.	

CH2M HILL Project #	Purchase Order		Γ					ST CODI	ES				D AREA FO	R LAB USE	ONLY
SEA359511.GA	_1									:	-	Lab 1#	11-74	Lab 2#	
RHONE POULENC Company Name CH2M HILL Office			#									Quote #		Kit Request	
• •			P							_	!	ļ			
Project Manager & Phone #	Report Copy to:						ANALYSE	S REQUE	STED			Project #			
MS & BT OPLARTY		CO				į			:.		<u> </u>				
Requested Completion Date: Sampling		nple Disposal: pose Return	N T A							:		No. of San	iples 나	Page	ر، ا
Type Matrix			NER							: ·		COC Rev	Login	LIMS Ver	Ack Gen
Sampling C G W S O R A O M A T I P B E L R	CLIENT SAMPLE (9 CHARACTER	ID S)	S		ļ		!			-			EMARKS	LAB 1	LAB 2
	1/1/1/21		-	 			- 	<u> </u>	-	····	•			ID	"
5/25/13/14:00 NX RP	1910		2		j	. .						PECO	VC-1	14	
				. .			į		1 1	i		ì			
			ŀ					İ		!		ļ			
	1 1 1 1									t :				ì	
			1			İ				į				•	
							1		-						
			l			-	i				;			Ì	
								i i		} 1		ļ		1	
			Ì	1						İ					
										:			•		
Sampled By & Time (Please sign and part)	parma) HYDACUEDIOJIA	Daily/Time	4 14	Belinquist	ed By	De (P)	ease sign and	print name	CONNUZ	<u> </u>	Date/T	ima/\$ DD	HAZWRAP/NI	SSA: Y	
Accelved By Phose sign and print	nutro)	Date/Time_				EVECT (1º)	(! lease sign and	pont name)	LOWNO		Date:T	5/73 ime	QC Level: (r;
Received By (Pieuse sign and prink		Date/Time	:1 /	Relinquist	ed By	(P	ease sign an	s print name))		Date/T		COC Rec L Ana Req / Cust Seal	TEMP	
Received By (Please sign and print	name)	Date/Time		Shipped V UPS E		ed-Ex	Hand	Other		Shippin	570	18155	50 B		
Work Authorized By (Please sign and prins	name)	Remarks WAS	.TE	7										-	

RHÔNE-POULENC INC. ORGANIC CHEMICALS DIVISION

9229 E. Marginal Way South - P.O. Box 80963 - Seattle, Washington 98108 - Telephone: (206) 764-4450

May 14, 1993

Mr. Rod Gravley CH2M Hill 2300 N.W. Walnut Blvd. Corvallis, OR 97339

Dear Mr. Gravley:

Rhone-Poulenc Inc. is requesting bids for quantitatively analyzing one or more samples of nonaqueous liquid for toluene and three specific plasticizers. None or all of the following plasticizers may be present:

- 1. Palatinol DOP (BASF trade name); DEHP; dioctyl phthalate; bis (2-ethylhexyl) phthalate; 1, 2-benzenedicarboxylic acid bis (2-ethylhexyl) ester.
- 2. Palatinol 711 (BASF trade name); di (C7,9,11 alkyl) phthalate; 1,2 benzenedicarboxylic acid di (C7.9,11 alkyl) esters
- 3. Santicizer 148 (Monsanto trade name); isodecyl diphenyl phosphate (87 - 91%) and triphenyl phosphate (4 - 6%)

Samples of these plasticizers and MSDS's will be provided at the time that the unknown sample is sent. Toluene is known to be present in the sample to be analyzed, and other components such as straight chain and branched hydrocarbons may also be present.

If you are interested in submitting a bid, please include proposed methodology, estimated time required for performing the work, and the quantities of plasticizers and unknown liquid needed for the analyses.

In requesting this bid I am acting under instructions of an attorney rendering legal advice in anticipation of potential litigation. Because of this, I am asking that all work related to this project remain privileged and confidential and be labeled as such. Only one report on the analysis of the sample (s) is to be generated and it, along with the bid currently being solicited, are to be submitted to Mr. George S. Goodridge, Senior Environmental Attorney, Rhone-Poulenc Inc. CN 5266, Princeton, NJ 08543-5266.

If you have any questions or need additional information, please call me at (206) 764-4450 or, alternatively, FAX 206/764-4498 FAX -908/821-2787 Patt O'Flaherty of CH2M Hill at (206) 453-5000.

Sincerely,

Luc E. Haye

Sue E. Hays Consultant

cc: G.S. Goodridge

E. Liu

P. O'Flaherty

RHÔNE-POULENC INC. DREANIC CHEMICALS DIVISION

9229 E. Marginal Way South

Seattle, Washington 98108 - Telephone: (206) 754-4450

July 21, 1993

Kathy McKinley CH2M-HILL, Corvallis Office 2300 NW Walnut Boulevard Corvallis, OR 97330-3538

Dear Kathy:

Confirming our telephone conversation yesterday, I would like CH2M-HILL to perform the analyses requested in my letter of May 14, 1993, and the additional analyses discussed in my later telephone conversation with Kelly Cook. The project, therefore, consists of analyzing the liquid sample sent to you for the three plasticizers, toluene, and the other nonaqueous constitutients according to the proposed methodology and pricing as stated in Kelly's June 28, 1993, letter. I am sending, under separate cover, a sample of Peneteck Oil (white mineral oil), a possible component of the nonaqueous sample.

I would like to add TCLP for all eight metals and flash point to the requested analyses. Let me know if additional sample will be needed for these analyses.

Please send the report to George Goodridge, as requested in my original letter. As we discussed today, you will be able to have the results ready within 21 days. If it is possible to have them in less time, it would be appreciated. I will be out of town until August 16, but any questions can be addressed to Patt O'Flaherty at (206) 453-5000.

Sincerely,

Sue E. Hays, Consultant

cc: Kally Cook

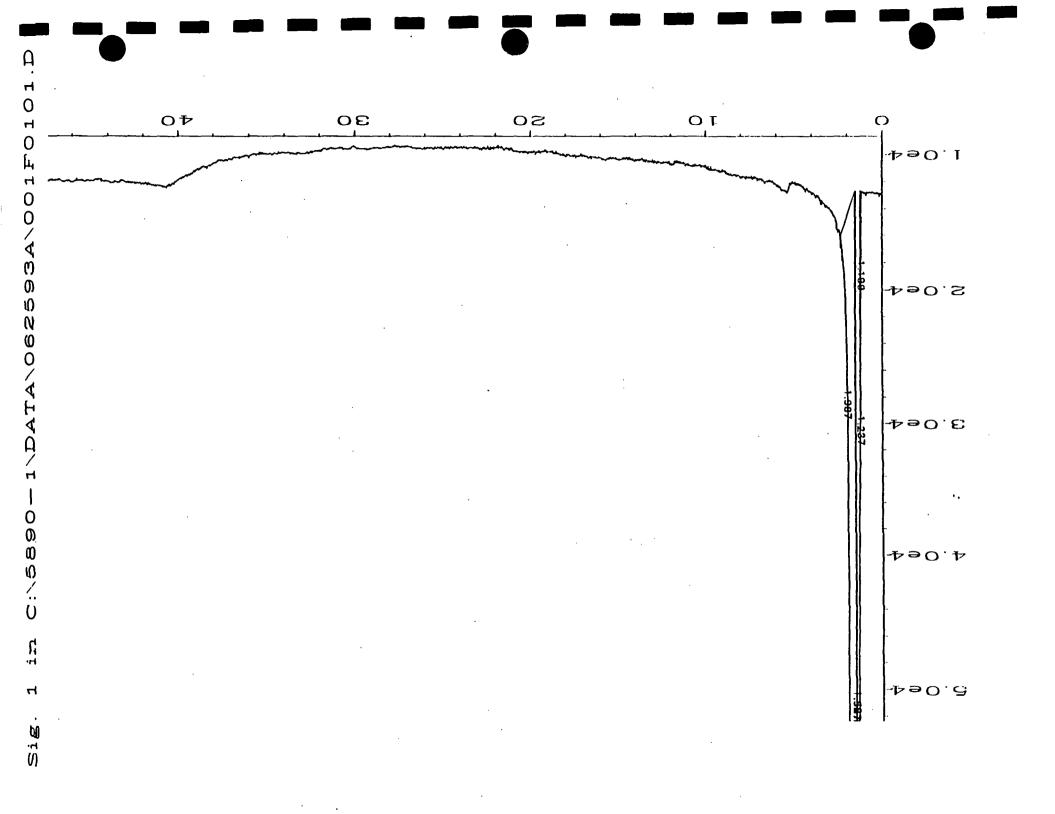
George Goodridge

Edwin Liu

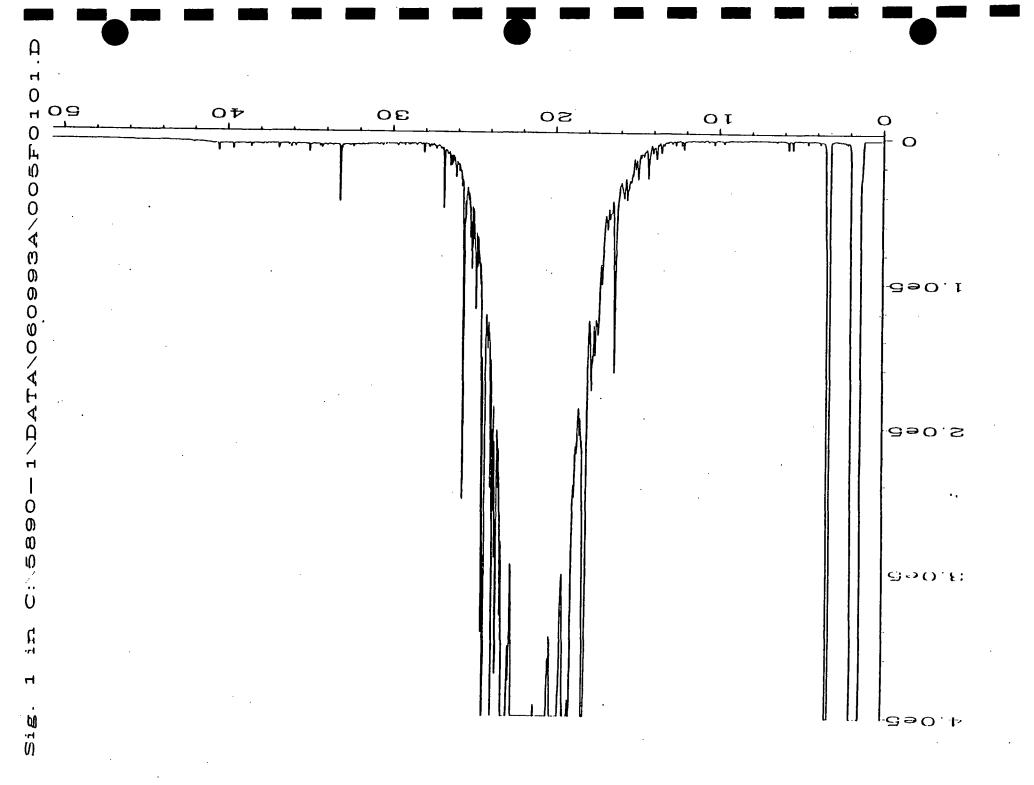
Patt O'Flaherty

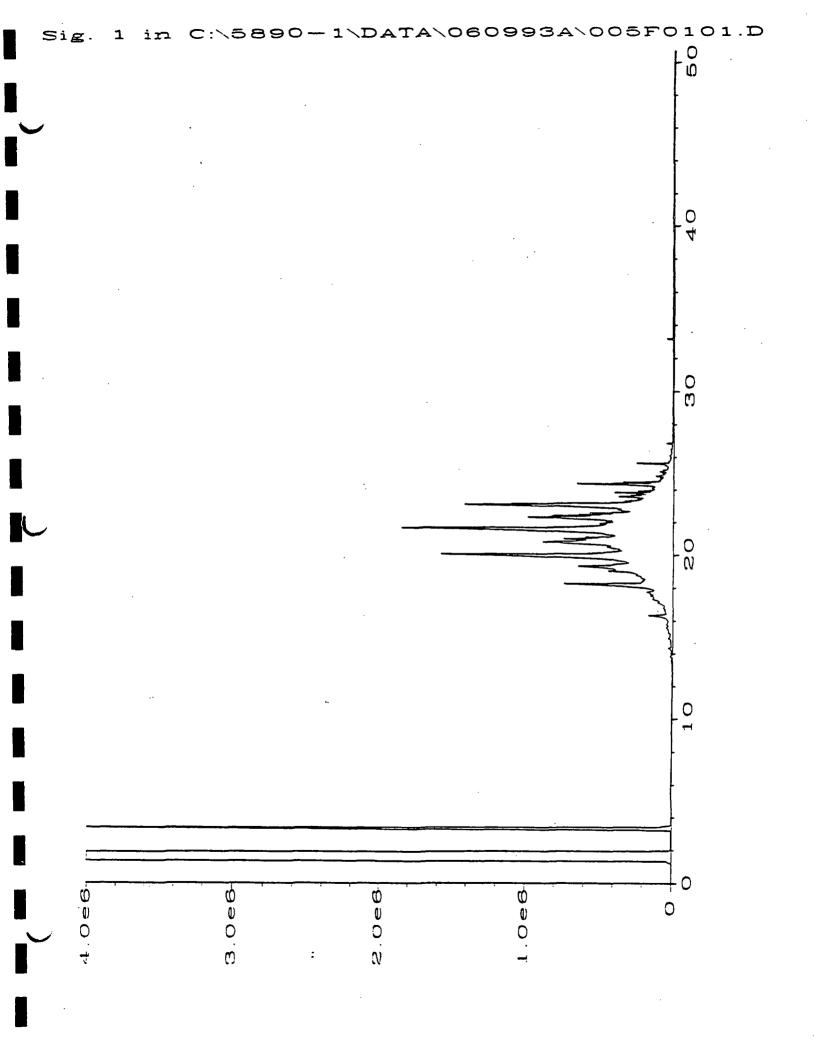


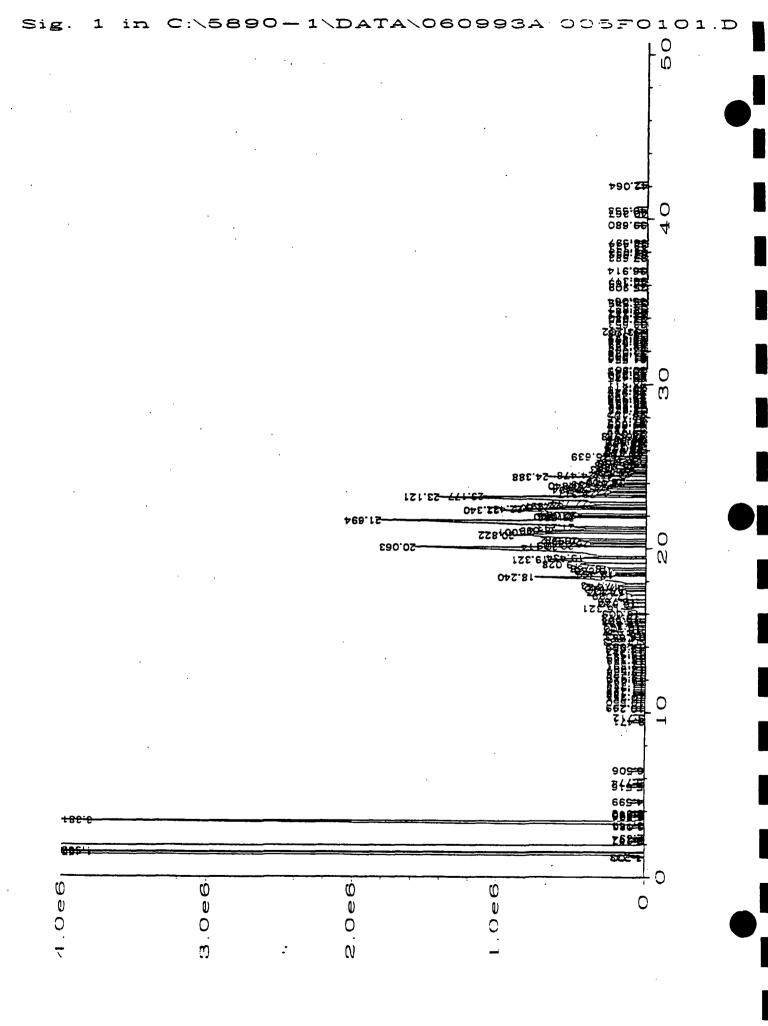
PRELIMINARY DATA



```
External Standard Report
                     Data File Name : C:\5890-1\DATA\062593A\001F0101.D
Operator : K. Cook
Instrument : 5890-1
                                            Page Number
Vial Number
              : 5890-1
Sample Name
              : MeCl Blank
                                            Injection Number: 1
Run Time Bar Code:
                                            Sequence Line : 1
                                          Instrument Method: 060993A.MTH
Analysis Method: 060993A.MTH
Sample Amount: 0
Acquired on : 25 Jun 93 03:30 PM
Report Created on: 25 Jun 93 04:20 PM
Last Recalib on : 28 APR 93 04:03 PM
Mulciplier
                                            ISTD Amount
Sig. 1 in C:\5890-1\DATA\062593A\001F0101.D
Ret Time Area Type Width Ref# UG/ML
                                                        Name
|----|
  7.000 * not found *
                                            GAS (C8-C10)
 23.250 * not found *
                                            DIESEL (C10-C28)
                               1
                         0.015 OIL (C28-C36)
0.015 5077.709 * uncalibrated *
 40.000 * not found *
  1.199
1.237
               5078 BV
              23607 VV 0.024
                                   23606.96 * uncalibrated *
                                  6.4E+008 * uncalibrated *
  1.491 6.37983E+008 HH S 0.102
  1.527 1.84018E+008 HH S 0.033
                                   1.8E+008 * uncalibrated *
  1.557 5.9126E+008 HB S 0.104
                                   5.9E+008 * uncalibrated *
                716 BB T 0.008
  1.987
                                   716.455 * uncalibrated *
Calibration table contains at least one peak with amt = 0
Not all calibrated peaks were found
```







Area Percent Report

Data File Name : C:\5890-1\DATA\060993A\005F0101.D

Operator : K. Cook Page

Operator: K. CookPage Number: 1Instrument: 5890-1Vial Number: 5Sample Name: LNAPL1.50 Diluter in MECIInjection Number: 1

Run Time Bar Code: 1.50 5.00 in MECI Injection Number: 1

Run Time Bar Code: Sequence Line: 1

Acquired on : 07 Jun 93 08:18 PM Instrument Method: 060993A.MTH Report Created on: 08 Jun 93 04:00 PM Analysis Method : 060993A.MTH

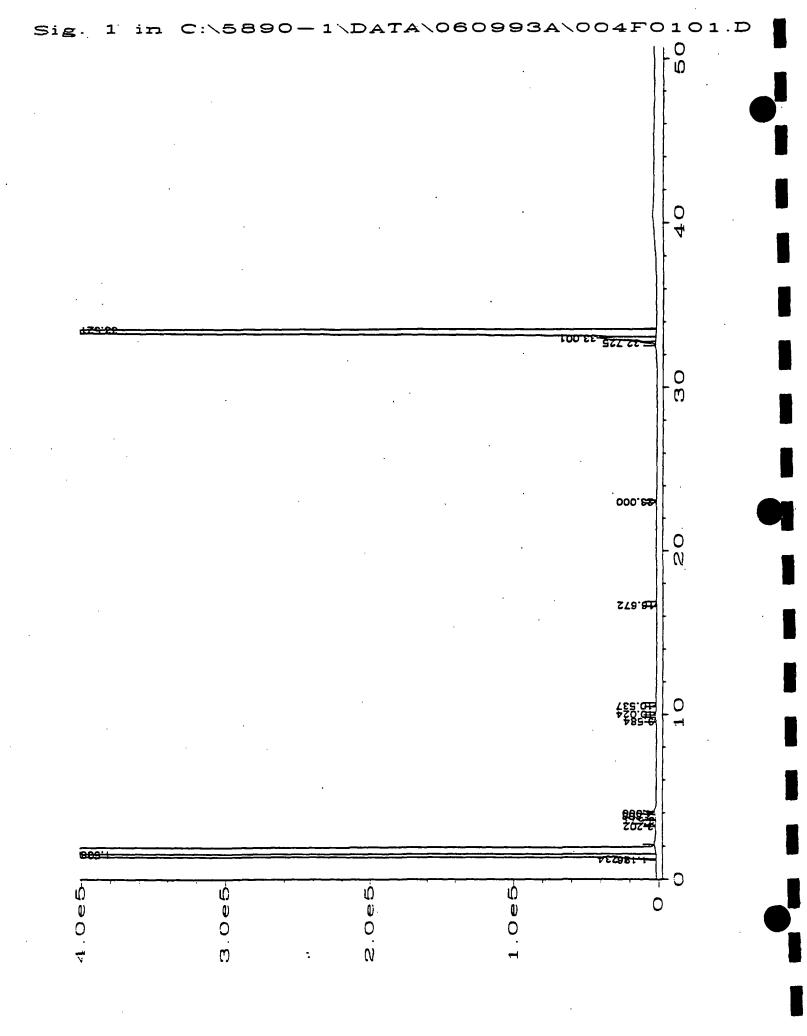
-							
Sig.	1 i	n C:\5890-	1\DATA\060993A\0	05F0101 D			
	Pk#	Ret Time	Area	Height	Type	Width	Area %
1.				nergue	1	WIGGI	ALEA 6
ı	1 '	1.200	5213	5295	'BV '	0.015	0.0003
	1 2	1.238	23447	17194	VV	0.023	0.0014
	3	1.457	4.88981E+008	7.47581E+007	HH S	0.080	29.6528
	4	1.497	1.63412E+008	7.56911E+007	HH S	0.030	
	- 5	1.536	1.89068E+008	7.65541E+007	HH S		9.9096
	·5	1.563	5.75552E+008	7.70165E+007	HB S	0.031	11.4654
	7	2.161				0.093	34.9026
	8	2.267	1116 1252	1257		0.013	0.0001
	9	2.394		974	BB T PV T	0.018	0.0001
	10		602	558		0.016	0.0000
	11	3.083	1608	748	PV T	0.030	0.0001
		3.169	2163	1677	VV T	0.019	0.0001
	12	3.381	2.38342E+007	4297949	VV T	0.067	1.4453
	13	3.634	2873	806	VV T	0.048	0.0002
	14	3.708	971	403	VV T	0.032	0.0001
	15	3.758	1391	585	VV T	0.034	0.0001
	16 17	3.830	4693	1982	T VV	0.034	0.0003
		3.915	1353	674	VV T	0.030	0.0001
	18	4.599	5993	2385	BV	0.038	0.0004
	19	5.516	14910	5861	BV	0.038	0.0009
	20	5.774	17920	5705	BB	0.047	0.0011
	21 22	6.506	1834	714	BB	0.039	0.0001
		9.471	2326	713	BV	0.047	0.0001
	23	9.712	9023 1754	1937	VB BV	0.063	0.0005
	24	10.241	1754	63 <i>7</i> 2625	AA PA	0.040 0.037	0.0001
	25	10.299	6424		VV	0.047	0.0004
	26	10.650	3508	1048 823	BB	0.044	0.0002
	27	10.955	2439		BV	0.039	0.0001
	28	11.165	1544	606			0.0001
	29	11.235	1748	668	VV	0.040	0.0001 0.0001
	30	11.327	2195	694	VB	0.045	
	31	11.475	2145	641	BV	0.047	0.0001
	32	11.739	1035	513 23.6		0.033	0.0001
	33	11.867	1485	236	VV	0.088	0.0001
	34	12.020	2058	655 5794	BV	0.049	0.0001
	35	12.169	18745	5784	VV	0.047	0.0011 0.0005
	36	12.298	8359	2858	VB	0.043 0.073	
	37	12.554	3282	685	BV		0.0002
	38	12.667	9487	2843	VV	0.048	0.0006
	39	12.891	9630	1978	VV	0.066 0.077	0.0006
	40	13.178	7811	1521	VV		0.0005
	41	13.281	6585	1567	VV	0.060	0.0004 0.0011
	42	13.395	17688	3295	VV	0.080	
	43	13.547	48931	8169 200 <i>6</i>	VV	0.087	0.0030 0.0009
	44	13.712	14221	2996	VV	0.066	
	45	13.853	75762	11886	VV	0.085	0.0046
	46	13.956	13702	4695	VV	0.042	0.0008

	•					
47	14 053	52902	9010	vv	0.087	0.0032
	14.052 14.333	202160	8018		0.108	0.0123
48			25441	VV		0.0032
49	14.551	52477	7854	VV	0.087	
50	14.618	91399	10584	ŅΛ	.0.112	0.0055
51	14.794	59740	11326	VV	0.075	0.0036
5 2	14.947	212394	25882	$\nabla \nabla$	0.108	0.0129
53	15.100	135998	19182	VV	0.097	0.0082
54	15.262	125738	23688	VV	0.078	0.0076
- 55	15.391	238449	28168	VV	0.111	0.0145
_ 56	15.528	177041	33338	VV	0.089	0.0107
57	15.601	277498	39857	VV	0.097	0.0168
58	15.778	544130	38768	VV	0.180	0.0330
59	16.009	127690	30249	VV	0.063	0.0077
60	16.321	1684263	160045	VV	0.141	0.1021
61	16.630	747201	52812	vv	0.179	0.0453
62	16.766	574793	59804	vv	0.125	0.0349
_ 63	17.099	1292931	98056	VV	0.170	0.0345
64	17.327	1488353	133582	VV	0.145	0.0903
65	17.404	466390			0.054	0.0283
			126440	VV		
66	17.510	1015093	147398	VV	0.097	0.0616
67 68	17.642	938161	153155	VV	0.086	0.0569
	17.743	1658414	172209	VV	0.130	0.1006
69	18.240	8773295	740741	VV	0.150	0.5320
7 0	18.341	1180657	210999	VV	0.078	0.0716
71	18.455	1161987	202633	VV	0.081	0.0705
72	18.638	2116496	215876	VV	0.120	0.1283
_ 73	18.768	1784001	246242	VV	0.101	0.1082
74 75	19.028	5588653	434092	VV	0.172	0.3389
7 5	19.321	8925821	645965	VV	0.184	0.5413
76	19.434	2337868	402864	VV	0.082	0.1418
77	20.063	2.41892E+007	1572281	vv	0.187	1.4669
78	20.114	1889520	576921	VV	0.046	0.1146
79	20.169	2719544	470309	vv	0.096	0.1649
- 80	20.296	1810590	369025	VV	0.071	0.1098
81	20.434	2821790	417147	VV	0.113	0.1711
82	20.512	2831900	445103	vv	0.085	0.1717
83	20.822	1.39255E+007	878746	vv	0.198	0.8445
84	21.001	4768391	741355	VV	0.092	0.2892
85	21.099	3949540	593124	VV	0.087	0.2395
86	21.293	3164380		VV		0.1919
			467362		0.091	
87	21.694	2.90617E+007	1816281	VV	0.193	1.7624
88	21.882	1497839	468492	VV	0.053	0.0908
89	21.940	1576529	494964	VV	0.045	0.0956
90	21.985	1378142	471572	VV	0.049	0.0836
91	22.064	2179285	452923	VV	0.070	0.1322
92	22.340	1.13892E+007	985123	VV	0.146	0.6907
_ 93	22.431	3197753	825455	VV	0.053	0.1939
94	22.501	2449226	639089	VV	0.052	0.1485
95	22.597	2972560	566079	VV	0.069	0.1803
96	22.784	3319581	372912	VV	0.116	0.2013
97	23.121	1.43624E+007	1408970	VV	0.126	0.8710
98	23.177	4590276	1099915	VV	0.070	0.2784
99	23.317	2426379	326612	VV	0.099	0.1471
_ 100	23.452	1201213	238953	VV	0.069	0.0728
101	23.594	2499924	367591	vv	0.094	0.1516
102	23.695	1119054	287258	vv	0.056	0.0679
102	23.773	758015	254799	VV	0.042	0.0460
104	23.773	1482177	398013	VV	0.052	0.0899
104	23.939	979349	238787	VV	0.056	0.0594
105					0.056	0.0394
	24.016	463941	135964	VV		
107	24.100	827617	142351	VV	0.088	0.0502
108	24.167	378515	131228	VV	0.048	0.0230
					•	•

109	24.388	4126478	647405	VV	0.085	0.2502
110	24.478	1492272	337426	VV	0.064	0.0905
111	24.588	492149	97697	vv	0:067	0.0298
112	24.674	317465	83114	γv	0.054	0.0193
113	24.767	414055	85466	٧v	0.067	0.0251
	24.863					
114		699141	114663	VV	0.081	0.0424
115	24.977	201806	66176	$\nabla \nabla$	0.043	0.0122
116	25.059	266255	71483	VV	0.052	0.0161
117	25.133	263571	86887	$\nabla \nabla$	0.043	0.0160
118	25.180	163845	65222	$\nabla \nabla$	0.042	0.0099
119	25.236	270751	65102	VV	0.056	0.0164
120	25.346	213054	39360	VV	0.071	0.0129
121	25.510	322937	52013	vv	0.082	0.0196
122	25.639	860860	242183	VV	0.050	0.0522
123	25.704	78713	27488	VV	0.042	0.0048
124	25.764	127227		VV		
			30202		0.058	0.0077
125	25.845	107683	20209	VV	0.069	0.0065
126	25.948	93682	19435	VV	0.066	0.0057
127	26.043	5424 9	15377	VV	0.050	0.0033
128	26.126	153023	23481	VV	0.086	0.0093
129	26.255	46589	12889	VV	0.050	0.0028
130	26.340	47396	13895	VV	0.048	0.0029
131	26.407	65544	15349	VV	0.058	0.0040
132	26.510	49828	15824	VV	0.046	0.0030
133	26.583	27552	7813	VV	0.051	0.0017
134	26.656	43192	7952	vv	0.080	0.0026
135	26.878	133125	44191	VV	0.044	
						0.0081
136	26.975	21840	4883	vv	0.064	0.0013
137	27.065	30520	4252	VV	0.093	0.0019
138	27.364	32306	4202	W	0.100	0.0020
139	27.444	6763	2639	VV	0.043	0.0004
140	27.586	8043	2375	VV	0.049	0.0005
141	27.653	7656	2505	VV	0.044	0.0005
142	27.797	21408	3036	VV	0.103	0.0013
143	28.105	15978	6640	VV	0.037	0.0010
144	28.247	6286	1305	VV	0.064	0.0004
145	28.515	398 9	1014	VV	0.066	0.0002
146	28.569	6099	1617	VV	0.053	0.0004
147	28.795	2315	869	$\nabla \nabla$	0.039	0.0001
148	28.855	2367	948	VV	0.037	0.0001
149	28.966	4118	1404	VV	0.044	. 0.0002
150	29.046	4375	1218	VV	0.051	0.0003
151	29.290	4419	1505	PV	0.043	0.0003
152	29.454	2627	792	VV	0.052	0.0002
153	29.525	2320	712	VV	0.047	0.0001
154	29.718	7718	1737	PV	0.064	0.0005
155	29.811	785	421	VV	0.029	0.0000
156	30.241	1589	629	VV	0.039	0.0001
			845	PV	0.036	0.0001
157	30.435	1991				
158	30.560	2392	523	VV	0.076	0.0001
159	30.634	7170	1513	VV	0.072	0.0004
160	30.845	3383	1050	VV	0.049	0.0002
161	30.907	3609	843	VV	0.057	0.0002
162	31.556	[] 2917	837	PV	0.053	0.0002
163	31.642	3074	824	VV	0.055	0.0002
164	31.712	1942	740	VV	0.039	0.0001
165	31.765	3799	846	vv	0.063	0.0002
166	31.934	4034	970	VV	0.061	0.0002
167	32.043	3112	792	VV	0.055	0.0002
168	32.289	3036	782	νν	0.054	0.0002
169	32.421	6087	1941	vv	0.047	0.0004
170	32.528	1696	601	VV	0.047	0.0001
1 /0	J& . J&O	2000				-

	•	• ,				
171	32.616	4552	1175	$\mathbf{v}\mathbf{v}$	0.057	0.0003
172	32.706	3219	815	$\nabla \nabla$	0.056	0.0002
173	32.977	3354	853	₽V	0.056	0.0002
174	33.108	6731	2846	VV	0.036	0.0004
_175	33.202	88811	38384	ΫV	0.036	0.0054
.76	33.653	4018	886	VV	0.064	0.0002
177	33.982	3270	1001	$\nabla \nabla$	0.048	0.0002
178	34.040	2852	770	VV	0.053	0.0002
179	34.221	4776	953	PV	0.074	0.0003
180	34.312	6000	2234	vv	0.041	0.0004
181	34.424	5755	1607	VV	0.050	0.0003
182	34.627	2310	548	PV	0.064	0.0001
183	34.945	4771	820	BV	0.076	0.0003
184	35.064	11634	5052	VV	0.036	0.0007
185	35.909	6835	1637	PV .	0.059	0.0004
186	36.165	7206	2192	BV	0.049	0.0004
187	36.317	2842	1109	$\nabla \nabla$	0.040	0.0002
188	36.914	11882	3191	VB	0.052	0.0007
189	37.683	3510 ·	849	VV	0.071	0.0002
190	37.882	2347	893	PV	0.039	0.0001
191	37.933	2050	892	VV	0.036	0.0001
192	38.033	2199	493	PV	0.066	0.0001
193	38.474	2615	888	BV	0.047	0.0002
194	38.597	4914	2143	PV	0.036	0.0003
195	39.680	9506	3269	VV	0.046	0.0006
196	40.367	2967	574	BB	0.073	0.0002
197	40.553	15627	4769	BB	0.051	0.0009
198	42.064	3483	649	BB	0.077	0.0002

Total area = 1.64902E+009



Area Percent Report

Data File Name : C:\5890-1\DATA\060993A\004F0101.D

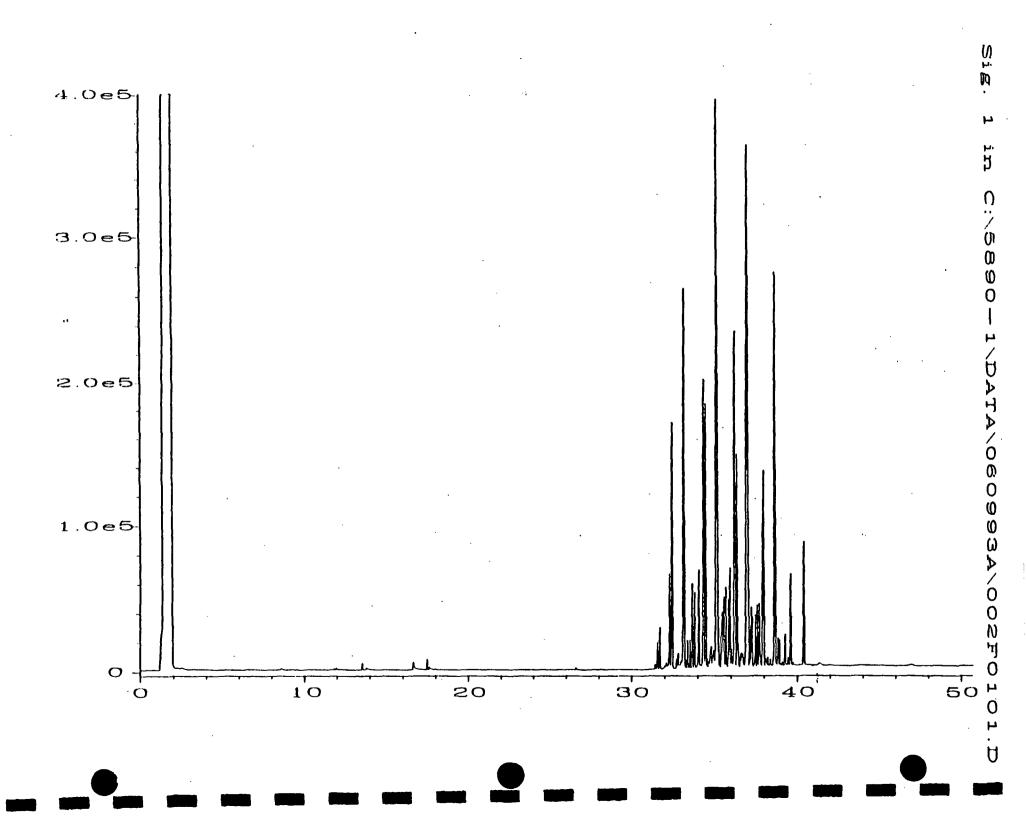
Operator : K. Cook Page Number : 1
Instrument : 5890-1 Vial Number : 4
Sample Name : Palatinol DOP Injection Number : 1
Run Time Bar Code: Sequence Line : 1

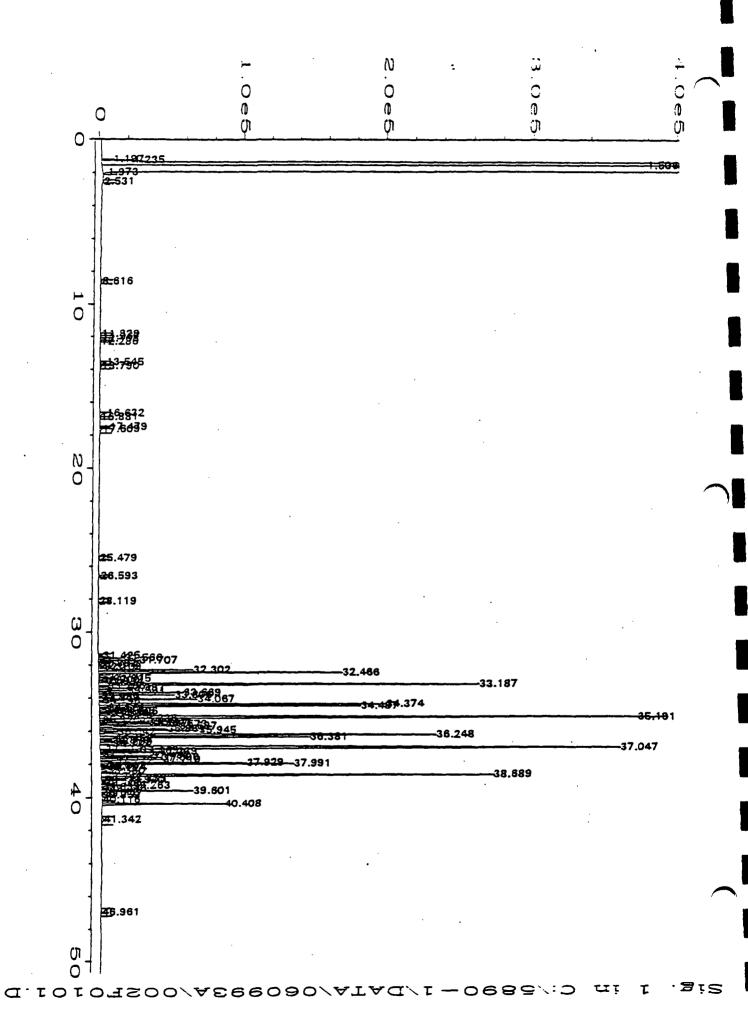
Acquired on : 07 Jun 93 07:18 PM Instrument Method: 060993A.MTH Report Created on: 08 Jun 93 03:55 PM Analysis Method : 060993A.MTH

Sig. :	1 in	C:\5890-1	\DATA\060993A`	\004F0101.D
--------	------	-----------	----------------	-------------

-3	Pk#	Ret Time	Area	Height	Type	Width	Area %
	1	1.196	5817	. 5968	BV	0.015	0.0004
	2	1.234	27167	18986	VV	0.020	0.0020
	3	1.508	7.4124E+008	7.61028E+007	HH S	0.162	54.8840
	4	1.535	5.95059E+008	7.65562E+007	HB S	0.101	44.0602
	5	3.202	1455	1052	BB	0.021	0.0001
	6	3.573	1102	624	BV	0.026	0.0001
	7	3.808	21209	1801	VV	0.144	0.0016
	8	4.000	10192	1322	vv	0.094	0.0008
	9	9.584	11452	1400	VB	0.109	0.0008
	10	10.024	4728	1293	BB	0.055	0.0004
	11	10.537	8426	1892	BB	0.066	0.0006
	12	16.672	8497	1304	BB	0.089	0.0006
	13	23.000	4244	1793	BB	0.036	0.0003
	14	32.725	50199	10545	BV	0.067	0.0037
	15	33.001	450840	40684	VV	0.134	0.0334
	16	33.521	1.36533E+007	1205115	VV	0.139	1.0109

Total area = 1.35056E+009





Area Percent Report

ara File Name : C:\5890-1\DATA\060993A\002F0101.D

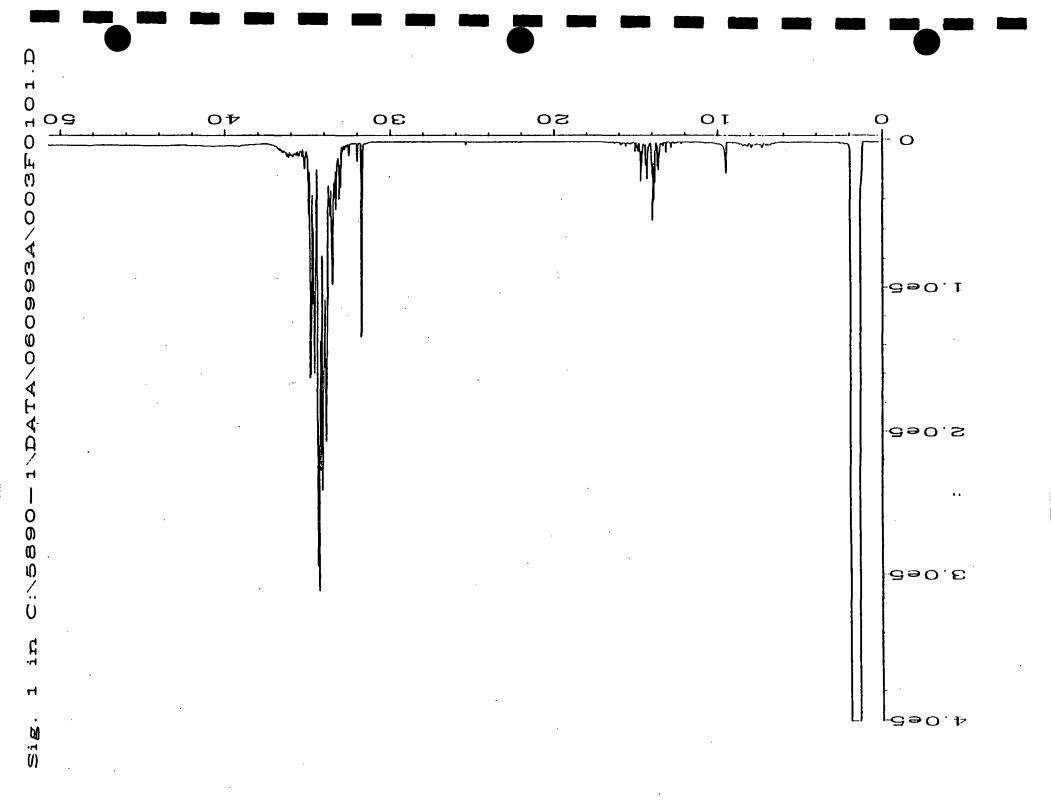
Corator : K. Cook Page Number : 1
Instrument : 5890-1 Vial Number : 2
Sample Name : Palantinol 711 Injection Number : 1
Run Time Bar Code: Sequence Line : 1

Acquired on : 07 Jun 93 05:17 PM Instrument Method: 060993A.MTH Report Created on: 08 Jun 93 03:46 PM Analysis Method : 060993A.MTH

Sig.	1 i	n C:\5890-1 Ret Time	\DATA\060993A\00 Area	02F0101.D Height	Type	Width	Area %
_ (
_	1	1.197	8362	8020	BV	0.016	0.0006
	. 2	1.235	34166	21928	VV	0.022	0.0025
	3	1.506	7.40336E+008	7.66974E+007	HH S	0.118	54.4200
	4	1.537	6.06634E+008	7.70634E+007	HB S	0.099	44.5919
	5 6 7	1.973	539	1036	BV T	0.008	0.0000
	6	2.531	3577	639	VB	0.071	0.0003
_		8.616	6396	1017	BB	0.078	0.0005
•	8	11.828	2782	995	BB	0.042	0.0002
	9	11.967	4635	1468	BV	0.046	0.0003
	10	12.108	2828	838	VB	0.048	0.0002
	11	12.286	1202	529	BB	0.037	0.0001
	12	13.545	9912	4394	BB	0.035	0.0007
	13	13.790	5704	1197	BB	0.066	0.0004
-	14	16.632	27298	4811	BV	0.078	0.0020
	15	16.881	3089	644	VB	0.066	0.0002
	16	17.479	13573	6836	BV	0.031	0.0010
-	17	17.609	10649	1739	PB	0.085	0.0008
_	18	25.479	1518	527	BB	0.043	0.0001
	19	26.593	2741	1208	BB	0.035	0.0002
	20	28.119	1616	608	BB	0.040	0.0001
	21	31.425	7222	2923	BV	0.038	0.0005
.	22	31.566	41377	17972	VV	0.036	0.0030
	23	31.707	64171	28248	VB	0.035	0.0047
	24	31.882	1525	566	BV	0.041	0.0001
_	25	32.015	9718	2196	vv	0.060	0.0007
B	26	32.109	13987	3787	vv	0.053	0.0010
	27	32.302	278360	65029	vv	0.041	0.0131
	28	32.466	505337	169322	vv	0.042	0.0371
	29	32.731	17411	6394	vv	0.040	0.0013
	30	32.815	29893	10138	vv	0.044	0.0022
_	31	32.900	10649	2375	vv	0.063	0.0008
-	32	32.994	19513	-5294	VV	0.054	0.0014
	33	33.187	-T006288	262940	vv	0.051	0.0740
	34	33.266	13303	6203	vv	0.033	0.0010
	35	33.387	44641	19193	VV	0.035	0.0033
	36	33.531	45636	19601	VV	0.036	0.0034
	37	33.669	- <u>-139817</u> -	58000	VV	0.037	0.0102
	38	33.806	. 121412	52005	VV	0.036	0.0089
	39	33.895	3599	1557	VV	0.035	0.0003
	40	33.959	4696	2025	VV	0.033	0.0003
	41	34.067	4036 277779	67285	VV	0.034	0.0003
_ (42	34.148	9547	2575	VV	0.052	0.0007
	43	34.374	696333	199180	VV	0.049	0.0512
	44	34.487	497464	181647	VV	0.039	0.0366
	45	34.561	12550	5872	VV	0.033	0.0009
7	46	34.672	16933	4581	VV	0.050	0.0012
	7.0	37.0/4	1023	#30T	VV	0.000	0.0012

47	34.766	43714	12488	VV.	0.048	0.0032
48	34.806	36560	14491	vv	0.037	0.0027
49	34.889	24045	8623	vv	0.040	0.0018
50	34.946	50064	12149	VV	0.060	0.0037
51	35.191	1905646	390706	νν	0.063	0.1401
52	35.236	- 71277	27338	vv	0.043	0.0052
53	35.320	4208	1931	vv	0.033	0.0003
54	35.417	85597	33384	VV	0.039	0.0063
55	35.471	95600	37903	vv	0.037	0.0070
56	35.537	80509	34719	vv	0.035	0.0059
57	35.573	100620	47992	vv	0.032	0.0074
58	35.697	130947	54795	VV	0.037	0.0074
59	35.861	118559	46392	vv	0.040	
60	35.945	164859	68153	VV	0.037	0.0087
61	36.042	42041	12601	VV		0.0121
62	36.248	<u>98</u> 0284	232706	VV	0.048	0.0031
63	36.381	395841			0.056	0.0721
64	36.452		146006	VV	0.041	0.0291
		22773	10507	VV	0.033	0.0017
65	36.570	22061	8907	VV	0.037	0.0016
66	36.638	30262	10131	VV	0.045	0.0022
67	36.722	45602	8972	VV	0.071	0.0034
68	37.047	_2242050	359756	VV	0.079	0.1648
69	37.113	7321	3547	VV	0.032	0.0005
70	37.169	63742	28031	, vv	0.036	0.0047
71	37.239	90360	40901	VV	0.034	0.0066
72	37.279	63973	33125	VV	0.029	0.0047
73	37.382	4136	1665	VV	0.038	0.0003
74	37.482	86972	35275	VV	0.038	0.0064
75	37.596	92202	41695	PV	0.034	0.0068
76	37.719	102520	42950	vv	0.037	0.0075
77	37.772	24282	10504	VV	0.035	0.0018
78	37.929	311706	100833	vv	0.048	0.0229
79	37.991	_311126	133935	VV	0.036	0.0229
80	38.061	9181	4610	VV	0.031	0.0007
81	38.107	11522	5196	VV .	0.034	0.0008
82	38.157	823 5	39.40	VV	0.032	0.0006
83	38.224	13540	5736	VV	0.037	0.0010
84	38.380	13186	4335	VB	0.045	0.0010
85	38.689	1056790	270499	BV	0.055	0.0777
86	38.742	5233	2424	vv	0.033	0.0004
87	38.835	61737	18713	vv	0.047	0.0045
88	38.940	38489	17504	vv	0.034	0.0028
89	39.105	5572	2269	VB	0.039	0.0004
90	39.263	52982	21397	BV	0.038	0.0039
91	39.339	2356	749	vv	0.044	0.0002
92	39.446	14025	5302	vv	0.040	0.0010
93	39.601	168569 :i	62744	VV	0.041	0.0124
94	39.747	5671	2105	VV	0.041	0.0004
95	39.859	1583	559	VB	0.044	0.0001
96	40.116	1583	448	BB	0.053	0.0001
97	40.408	266400	84072	BV	0.047	0.0196
98	41.342	18197	1429	BB	0.158	0.0013
99	46.961	11410	884	BB	0.160	0.0008
<i>33</i>	40.301	エエゴエハ	004	٥٥	0.100	0.000

Total area = 1.36041E+009



ibrated report not possible because no calibration table exists

Area Percent Report

at Tile Name : C:\5890-1\DATA\060993A\003F0101.D
pricor : K. Cook Page Page Number : 1 Vial Number : 3 : 5890-1 trument ample Name : Santicizer 148 Injection Number: 1 un Time Bar Code: Sequence Line : 1

equired on : 07 Jun 93 06:18 PM Instrument Method: 060993A.MTH eport Created on: 08 Jun 93 03:49 PM Analysis Method : 060993A.MTH

#. 1 i: Pk#	n C:\5890-1 Ret Time	\DATA\060993A\0		œ-∞-	Width	Area %
	Rec IIIIe	Area	Height	Type	MIGGII	l
1 1	1.200	6448	6520	BV	0.015	0.0005
1 · 2	1.238	27152		VV	0.013	0.0019
2			19911			
3	1.464	4.99822E+008	7.48863E+007	HH S	0.111	34.9790
4	1.533	3.4033E+008	7.67662E+007	HH S	0.054	23.8173
5 6	1.563	5.75762E+008	7.70859E+007	HB S	0.096	40.2935
- 5	1.991	« 623	1149	BV T	0.009	0.0000
7	6.563	3170	666	BV	0.065	0.0002
8	6.779	7735	1552	VV	0.067	0.0005
9	6.923	10994	1674	VV	0.084	0.0008
10	7.072	6750	1599	VV	0.058	0.0005
11	7.293	16645	2838	PV	0.081	0.0012
12	7.415	1001	458	VV	0.036	0.0001
13	7.466	2713	661	VB	0.061	0.0002
14	7.708	2040	798	BV	0.041	0.0001
15	7.779	3753	1198	VV	0.052	0.0003
1 1 1 1 1 1 1 1 1 1	7.821	4852	1292	VV	0.054	0.0003
17	7.932	14323	2781	VV	0.070	0.0010
18	8.176	12856	2170	PV	0.086	0.0009
19	8.284	6144	1582	VV	0.058	0.0004
20	8.408	4635	1379	VV	0.056	0.0003
_ 21	8.456	11677	2051	VV	0.082	0.0008
22	8.655	5865	1087	VV	0.081	0.0004
23	9.046	3532	. 688	PB	0.071	0.0002
24	9.492	123818	20566	PV	0.084	0.0087
25	9.853	5430	825	VV	0.087	0.0004
25 26	11.620	883	403	BV	0.033	0.0001
27	12.205	3658	1298	BB	0.042	0.0003
_ 28	12.512	2817	877	VV	0.045	0.0002
29	12.553	2597	795	VV	0.044	0.0002
30	12.634	3407	1296	VV	0.040	0.0002
31	12.824	9649	3784	vv	0.038	0.0007
32	12.898	2600	1067	VV	0.037	0.0002
33	13.140	14362	6944	VV	0.032	0.0010
34	13.208	2533	1004	VV	0.037	0.0002
35	13.314	6983	2749	VV	0.040	0.0005
36	13.387	5572	1877	VV	0.043	0.0004
37	13.466	4060	1846	VV	0.033	0.0003
3 8	13.529	20649	9895	VV	0.032	0.0014
39	13.610	68865	18829	vv	0.050	0.0048
40	13.686	34865	16487	vv	0.033	0.0024
41	13.804	59098	27075	VV	0.034	0.0041
42	13.886	103080	39405	VV	0.040	0.0072
43	13.948	121686	52507	VV	0.036	0.0072
44	14.003	71921	22533	VV	0.038	0.0050
45	14.178	7585	3641	VV	0.043	0.0005
46				VV		
40	14.220	14309	6641	VV	0.032	0.0010

47	14.298	87539	24852	vv	0.056	0.0061
48	14.340	22595	14030	vv	0.027	0.0016
49	14.408	30909	15656	$\mathbf{v}\mathbf{v}$	0.031	0.0022
50	14.456	3374	2180	vv	0.026	0.0002
51	14.488	4560	2346	ΫV	0.029	0.0003
52	14.540	6514	3326	VV	0.029	0.0005
53	14.628	52252	15234	vv	0.046	0.0037
54	14.683	74887	26082	vv	0.041	0.0052
55	14.803	12668	6170	VV	0.031	0.0009
56	14.876	12376	5761	vv	0.033	0.0009
5.7	14.924	8770	4026	vv	0.033	0.0006
5.7 58	15.016	14449	6087	vv	0.035	0.0010
59	15.217	2235	792	VV	0.043	0.0002
60	15.276	4036	1537	VV	0.038	0.0003
			1124	VV		0.0003
61	15.325	2568 4684			0.033	
62	15.388	4684	1224	VV	0.053	0.0003
63	15.458	3333	1129	VV	0.045	0.0002
64	15.597	10616	2629	VV	0.055	0.0007
65	15.712	1784	763	VV	0.035	0.0001
66	15.822	4359	1577	W	0.040	0.0003
67	15.906	6490	1903	VV	0.049	0.0005
68	16.283	3327	848	VB	0.058	0.0002
69	25.392	5438	2121	BB	0.039	0.0004
70	28.614	1560	629	BB	0.038	0.0001
71	31.458	8833	871	BV	0.141	0.0006
72	31.756	426972	132086	vv	0.045	0.0299
73	31.920	2481	984	VV	0.038	0.0002
74	32.005	29119	12155	VV	0.037	0.0020
75	32.203	2621	764	VV	0.051	0.0002
76	32.346	2153	821	PV	0.043	0.0002
77	32.418	731	393	∇V	0.031	0.0001
78	32.503	24251	7917	VV	0.045	0.0017
79	32.656	7611	2082	VV	0.054	0.0005
80	32.772	14476	3550	VV	0.063	0.0010
81	32.897	18669	4515	VV	0.064	0.0013
82	33.014	106715	29055	VV	0.054	0.0075
83	33.101	127084	36231	vv	0.051	0.0089
84	33.189	26818	10843	VV	0.036	0.0019
85	33.293	170864	42948	VV	0.057	0.0120
86	33.395	176552	36488	vv	0.066	0.0124
87	33.509	598722	93732	VV	0.088	0.0419
88	33.658	215855	46878	VV	0.061	0.0151
89	33.713	134637	39901	VV	0.049	0.0094
90	33.887	1708574	202224	VV	0.118	0.1196
91	34.106	1596655	236395	VV	0.090	0.1117
92	34.218	1016926	222391	vv	0.066	0.0712
93	34.336	1564621	306049	VV	0.070	0.1095
94	34.407	T012363	288990	VV	0.048	0.0708
95	34.519	246623	79417	VV	0.047	0.0173
96	34.597	582088	154430	vv	0.053	0.0407
97	34.638	311700	134466	vv	0.033	0.0218
98	34.710	297848	106508	vv	0.041	0.0208
		520751	154992	vv	0.049	0.0364
99	34.811	<u>5</u> 20751 412116	157211	VV	0.039	0.0288
100	34.865		43734	VV	0.051	0.0112
101	34.954	159865	4570	VV	0.031	0.0007
102	35.050	9560 10533	4760	VV	0.031	0.0007
103	35.110	10532	12992	VV	0.033	0.0050
104	35.197	70762	4465	ΡV	0.057	0.0012
105	35.360	17164	3903	VV	0.042	0.0008
106	35.501	11089	4040	VV	0.042	0.0008
107	35.572	11781	3384	VV	0.039	0.0006
108	35.653	8534	3304	VV	V. V. J	3.000

109	35.734	11056	3294	vv	0.048	0.0008
110	35.783	5830	2426	VV	0.034	0.0004
111	35.879	17028	3885	VV	0.060	0.0012
112	35.943	8264	3331	vv	0.041	0.0006
113	35.993	10024	3284	ÝV	0.046	0.0007
_114	36.070	8471	2693	vv	0.046	0.0006
L15	36.151	11129	3636	vv	0.047	0.0008
116	36.229	7363	2969	VV	0.040	0.0005
117	36.292	4526	2296	VV	0.032	0.0003
118	36.434	1835	1234	BV	0.026	0.0001
119	36.495	4227	2042	PV	0.033	0.0003
120	36.551	7692	2227	VV	0.048	0.0005
121	36.639	2388	1302	VV	0.030	0.0002
122	36.702	5041	1683	PV	0.044	0.0004
123	36.779	1733	_ 864	VV	0.031	0.0001
124	39.126	8432	/ 699	BV	0.150	0.0006
125	39.302	1417	256	VB	0.080	0.0001

tal area = 1.42892E+009

QUANTITATIVE DATA

Method Information

Quantitative Runs - LNAPL

Run Time Checklist

re-Run Program:

Name:

Parameter:

Pata Acquisition: "

ata Analysis:

sig. 2 Mth:

Post-Run Program:

Name:

Parameter:

none

On

On

none

none

Sequence Recalibration Table

Update Update Cal. Cal. Response Retention Recalib Line Level Factor Times Interval

Integration Events

Events:	Value:	Time:
Initial Area Reject	0	INITIAL
In ial Peak Width	0.040	INITIAL
noulder Detection	OFF	INITIAL
Thitial Threshold	2	INITIAL
<u> </u>	. 2	3.000

20 AUG 33 02:09 FM

Method: C:\HPCHEM\1\METHODS\RHONE727.MTH

 Baseline Now
 3.100

 Baseline Now
 3.600

 Baseline Now
 14.000

 Area Sum ON
 14.000

 Baseline Now
 30.000

 Area Sum OFF
 30.000

Report Specification

Destination: File: Auto naming selected

Printer

Based on: Area Calculations: ESTD

Output: Chromatogram

Report

Report Header: On Chromatogram

On Each Report Page

Graphics Print Options

Layout: Full Size Title: Vertical

Include:

Axes Units: On Retention Times: On Baselines: On

Retention Times Font: Times New Roman 8

Calibration Table

Pk#	RT	Lvl	UG/ML	Amt/Area	Ref	Istd	I#		Name
1	3.300	1	1098.0	8.6652e-005			1	Toluene	
		2	109.8	9.0086e-005					
		3	10.98	8.8522e-005					
2	22.003	1	119.0	7.419e-005			1	OMW	
3	33.288	1	12.7	9.5447e-005			1	Palatino	1 DOP

Calibration Settings

Title:

Reference window:

Non-reference window:

Units of amount:

Multiplier:

RF uncal peaks:

Sample Amount:

0.200 minutes

UG/ML

1.0

1.0

0.0

Sample ISTD Information

No Sample ISTD Amounts

Multilevel Information

Fit: Linear Origin: Include

Sequence: C:\HPCHEM\1\SEQUENCE\RHONE727.SEQ

Operator: Kelly Cook

Sequence preparation date: 31 Jul 93 10:56 AM

a File Subdirectory: rhone727

Part of methods to run: full method

On a barcode mismatch: inject anyway

Comment:

Sequence Table

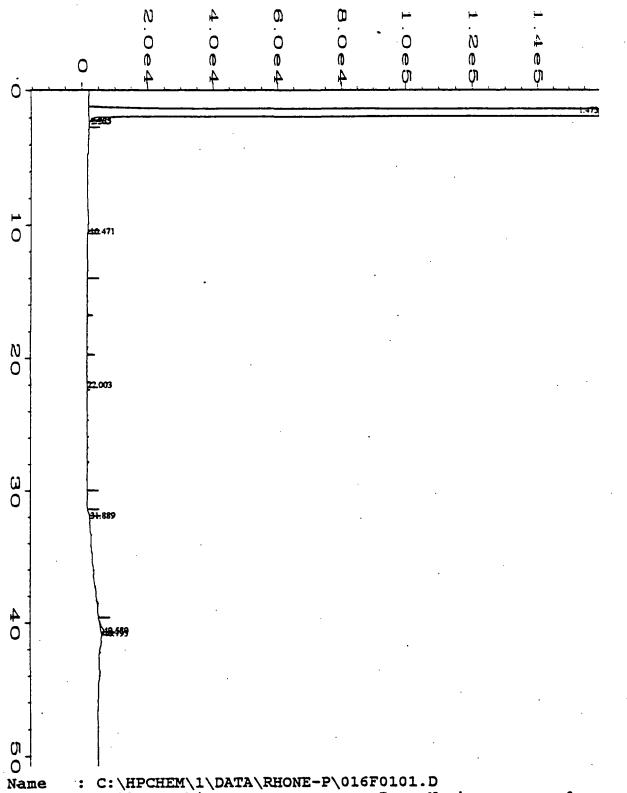
Inj. FRONT	Seq. Line	Cal. Line	Method Name	From Vial	To Vial	Inj/ Vial
■REAR	ī.		RHONE727	16	27	1
KEAK	1					

Sample Table

Vial Num.	Sample Name	Sample Amount	Multiplier	ISTD Amount
16 17	MECL BLANK			
17	LNAPL 1:50			
18	LNAPL 1:5000			
19	WMO 1000			·
19	WMO 100			
21	WMO 10 .			
22	PALATINOL 711			
23 24	SANTICIZER 148			
24	PALATINOL DOP			
25	TOLUENE 1000			
26 27	TOLUENE 100			•
27	TOLUENE 10			
_				

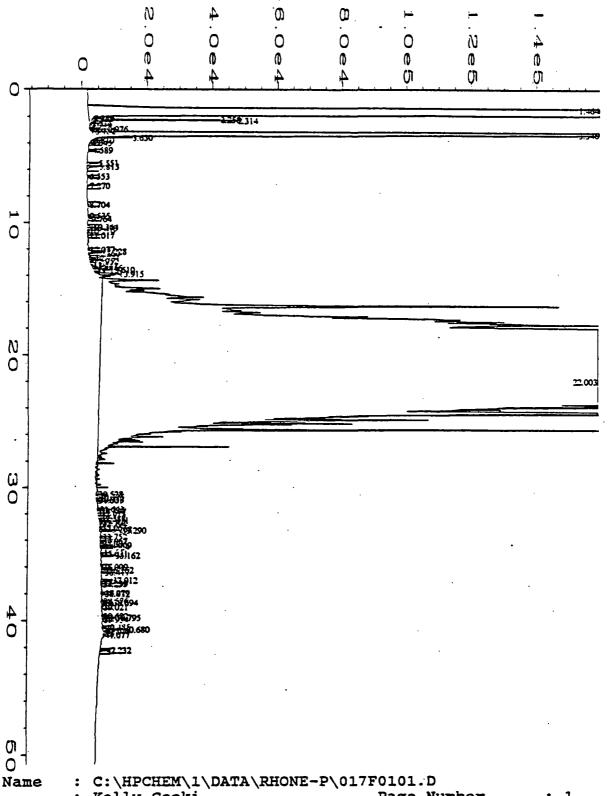
Sample Log Table

Vial Num.	Sample Name	Sample Multiplier Amount		
:	•	·		
16	MECL BLANK			RHONE727
17	LNAPL 1:50		•	RHONE727
18	LNAPL 1:5000			RHONE727
19	WMO 1000			RHONE727
20	WMO 100		•	RHONE727
21	WMO 10			RHONE727
22	PALATINOL 711			RHONE727
23	SANTICIZER 148			RHONE727
24	PALATINOL DOP			RHONE727
25	TOLUENE 1000	•		RHONE727
26	TOLUENE 100			RHONE727
27	TOLUENE 10		•	RHONE727
	Num. 16 17 18 19 20 21 22 23 24 25 26	16 MECL BLANK 17 LNAPL 1:50 18 LNAPL 1:5000 19 WMO 1000 20 WMO 100 21 WMO 10 22 PALATINOL 711 23 SANTICIZER 148 24 PALATINOL DOP 25 TOLUENE 1000 26 TOLUENE 100	Num. Name Amount 16 MECL BLANK 17 LNAPL 1:50 18 LNAPL 1:5000 19 WMO 1000 20 WMO 100 21 WMO 10 22 PALATINOL 711 23 SANTICIZER 148 24 PALATINOL DOP 25 TOLUENE 1000 26 TOLUENE 100	Num. Name Amount Amount Lin 16 MECL BLANK 17 LNAPL 1:50 18 LNAPL 1:5000 19 WMO 1000 20 WMO 100 21 WMO 10 22 PALATINOL 711 23 SANTICIZER 148 24 PALATINOL DOP 25 TOLUENE 1000 26 TOLUENE 100



Data File Name :	C:\HPCHEM\1\DATA\RHONE-P\016F	F0101.D	
Operator :	Kelly Cooki	Page Number :	1
Instrument :		Vial Number :	16
Sample Name :		Injection Number:	1
Run Time Bar Code:		Sequence Line :	1
	26 Jul 93 11:07 AM	Instrument Method:	RHONE727.M
	20 Aug 93 02:42 PM	Analysis Method :	RHONE727.
		Sample Amount :	
Multiplier :		ISTD Amount :	

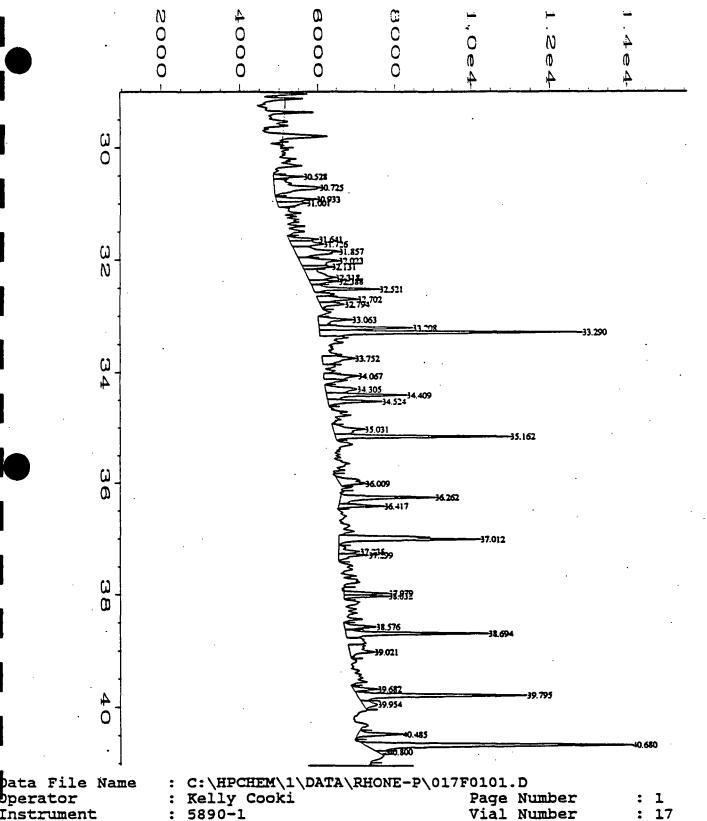
```
ata File Name : C:\HPCHEM\1\DATA\RHONE-P\016F0101.D
              : Kelly Cooki
                                            Page Number
perator
                                           Vial Number
              : 5890-1
                                                          : 16
Itrument
              : MECL BLANK
                                            Injection Number: 1
ample Name
un Time Bar Code:
                                            Sequence Line : 1
               : 26 Jul 93 11:07 AM
                                            Instrument Method: RHONE727.M
Acquired on
Report Created on: 20 Aug 93 02:42 PM
                                          Analysis Method : RHONE727.M
ast Recalib on : 20 AUG 93 01:14 PM
                                            Sample Amount : 0
                                           ISTD Amount
Multiplier
               : 1
ig. 1 in C:\HPCHEM\1\DATA\RHONE-P\016F0101.D
et Time Area Type Width Ref# UG/ML
                                                       Name
3.300 * not found *
                               1
                                            Toluene
                                      1.313 WMO
 22.003
             17698 BB + 0.000
 33.288 * not found *
                                            Palatinol DOP
  1.473 1.12795E+009 BB S 0.198
                                   1.1E+009 * uncalibrated *
                                    325.372 * uncalibrated *
  2.223
                325 BV T 0.024
                174 VB T 0.031
                                    173.630 * uncalibrated *
  2.265
                                   3648.130 * uncalibrated *
 10.471
               3648 BB
                        0.073
                196 BB
                                    195.849 * uncalibrated *
 31.889
                        0.016
 40.580
              23157 BV
                        0.335
                                   23157.11 * uncalibrated *
  40.795
              4722 VB
                        0.092
                                   4722.165 * uncalibrated *
```



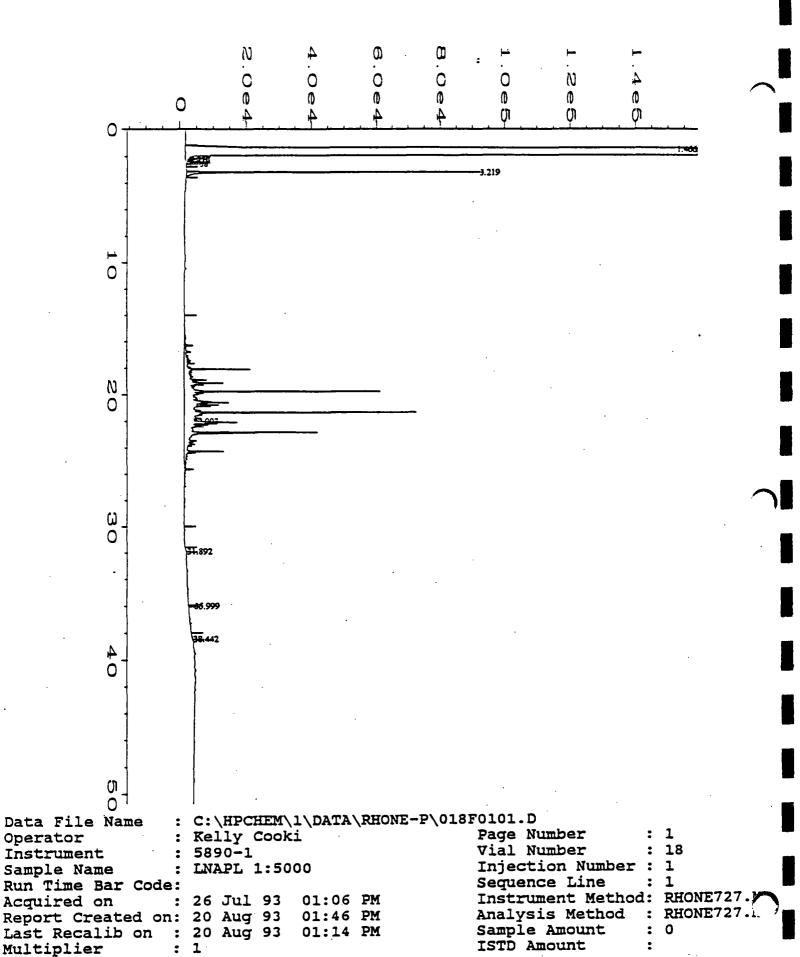
```
Data File Name
                                                  Page Number
Operator
                  : Kelly Cooki
                                                  Vial Number
                                                                    : 17
Instrument
                  : 5890-1
                                                  Injection Number: 1
Sample Name
                  : LNAPL 1:50
Run Time Bar Code:
                                                  Sequence Line
                                                                    : 1
                                                  Instrument Method: RHONE727
Acquired on
                  : 26 Jul 93
                               12:05 PM
Report Created on: 20 Aug 93
                               01:59 PM
                                                  Analysis Method
                                                                    : RHONE727.
                                                  Sample Amount
                               01:14 PM
Last Recalib on
                  : 20 Aug 93
                                                  ISTD Amount
Multiplier
                  : 1
```

```
ata File Name : C:\HPCHEM\1\DATA\RHONE-P\017F0101.D
                                                Page Number
nerator
                 : Kelly Cooki
 trument
                 : 5890-1
                                                Vial Number
                                                                  : 17
Tample Name
                : LNAPL 1:50
                                                Injection Number: 1
Run Time Bar Code:
                                                Sequence Line
                 : 26 Jul 93 12:05 PM
                                                Instrument Method: RHONE727.M
Acquired on
Report Created on: 20 Aug 93 02:00 PM
                                                Analysis Method : RHONE727.M
Last Recalib on : 20 Aug 93 01:14 PM
                                                Sample Amount
Multiplier
                                                ISTD Amount
big. 1 in C:\HPCHEM\1\DATA\RHONE-P\017F0101.D
Ret Time Area Type Width Ref# UG/ML
                                                             Name
  1766.465 Toluene ×50 = 5.63%
   3.346 2.03906E+007 VBA 0.072 1
                                       13385.26 WMO X50 = 66.9%
  22.003 1.80419E+008 BB + 0.000 1
                                          1.720 Palatinol DOP ,50 = 86 ppm
   3.290 18020 VV 0.041 1 1.720 Palatinol DOP > 5
1.464 1.11006E+009 BBAS 0.195 1.1E+009 * uncalibrated *
  33.290
                                       614.421 * uncalibrated *
   2.126
                  614 BV T 0.025
                  281 VV T 0.016
                                        280.515 * uncalibrated *
   2.149
   2.181
                  616 PV T 0.017
                                        616.486 * uncalibrated *
   2.212
                  139 VV T 0.020
                                        139.161 * uncalibrated *
                47718 PV T 0.019
                                       47717.65 * uncalibrated *
   2.258
                                       80266.85 * uncalibrated *
                80267 VV T 0.026
   2.314
                  845 VV T 0.028
                                        845.241 * uncalibrated *
   2.521
                 1077 VV T 0.039
                                       1077.223 * uncalibrated *
   2.576
                                        123.589 * uncalibrated *
   2.645
                  124 PB T 0.022
                                       8949.000 * uncalibrated *
   2.976
                 8949 PV T 0.024
   3.056
                 3525 VB T 0.035
                                       3525.389 * uncalibrated *
   3.152
                 1949 BV
                                       1948.986 * uncalibrated *
                           0.023
                22383 BV
                                       22383.04 * uncalibrated *
   3.630
                           0.030
                                       1458.986 * uncalibrated *
   3.810
                 1459 PV
                           0.032
                           0.038
                                       1660.435 * uncalibrated *
   4.045
                 1660 PV
   4.589
                3867 PV
                           0.052
                                       3867.133 * uncalibrated *
   5.551
                                       15581.66 * uncalibrated *
                15582 BV
                           0.067
                                       19369.71 * uncalibrated *
   5.813
                19370 VB
                           0.076
   6.553
                 2287 BB
                                       2286.590 * uncalibrated *
                           0.065
   7.270
                 3846 BB
                           0.079
                                       3845.914 * uncalibrated *
                                       2514.169 * uncalibrated *
   8.704
                 2514 BV
                           0.078
  9.535
                 1603 BB
                           0.049
                                       1602.920 * uncalibrated *
                                       3561.968 * uncalibrated *
   9.764
                 3562 BV
                           0.056
 10.364
                 8532 BV
                           0.064
                                       8532.203 * uncalibrated *
                                       9972.590 * uncalibrated *
                 9973 VV
 10.470
                           0.099
 10.719
                 3965 VB
                           0.076
                                       3965.380 * uncalibrated *
                                       3372.291 * uncalibrated *
 11.017
                 3372 BV
                           0.078
 12.077
                 2993 VV
                                       2992.590 * uncalibrated *
                           0.107
 12.228
                16451 VV
                           0.056
                                       16451.15 * uncalibrated *
 12.360
                 8008 VV
                                       8007.849 * uncalibrated *
                           0.059
 12.731
                 6415 VV
                           0.053
                                       6415.362 * uncalibrated *
                 4797 VV
                                       4796.595 * uncalibrated *
 12.952
                           0.061
 13.241
                  882 PV
                           0.039
                                        881.719 * uncalibrated *
 13.347
                  892 PV
                           0.046
                                        892.378 * uncalibrated *
 13.456
                 6991 VV
                           0.071
                                       6991.170 * uncalibrated *
 13.610
                25272 VV
                                       25272.31 * uncalibrated *
                           0.075
  3.770
                 1641 PV
                           0.033
                                       1641.164 * uncalibrated *
  13.915
                                       33943.86 * uncalibrated *
                33944 PBA
                           0.075
 30.528
                 1753 BV
                           0.036
                                       1752.736 * uncalibrated *
 30.725
                 8724 VV
                           0.106
                                       8724.037 * uncalibrated *
 30.933
                 3219 PV
                           0.051
                                       3219.235 * uncalibrated *
```

```
___ ... ...c
                    ... /##c### /# /pw/# /##c#### /01/#####
                                                                     : 2
Operator
                  : Kelly Cooki
                                                  Page Number
                                                  Vial Number
                  : 5890-1
                                                                     : 17
Instrument
                                                   Injection Number: 1
Sample Name
                  : LNAPL 1:50
Run Time Bar Code:
                                                  Sequence Line
                                                                     : 1
Acquired on
                  : 26 Jul 93
                                12:05 PM
                                                  Instrument Method: RHONE727
                                                  Analysis Method : RHONE727
Report Created on: 20 Aug 93
                                02:00 PM
Last Recalib on : 20 Aug 93
                                01:14 PM
                                                  Sample Amount
Multiplier
                  : 1
                                                  ISTD Amount
  31.001
                  3156 VV
                             0.056
                                         3155.707 * uncalibrated *
                  1951 PV
                                         1950.824 * uncalibrated *
                             0.044
  31.641
                  3998 VV
                             0.067
                                         3998.422 * uncalibrated *
  31.726
                  7466 VV
                                         7466.422 * uncalibrated *
  31.857
                             0.092
                            0.078
                                         5779.878 * uncalibrated *
  32.023
                  5780 VV
  32.131
                  2195 VV
                            0.042
                                         2195.151 * uncalibrated *
                  5305 VV
                            0.096
                                         5305.158 * uncalibrated *
  32.318
                  2208 VV
                                         2208.164 * uncalibrated *
  32.388
                            0.042
                                         5120.549 * uncalibrated *
                  5121 VV
                            0.045
  32.521
                                         3865.118 * uncalibrated *
                  3865 VV
                            0.058
  32.702
                                         2191.530 * uncalibrated *
  32.794
                  2192 VB
                            0.055
  33.063
                  3624 PV
                            0.059
                                         3624.015 * uncalibrated *
  33.208
                  6770 VV
                            0.042
                                         6770.202 * uncalibrated *
                  4694 VV
                                         4694.096 * uncalibrated *
  33.752
                            0.079
                                         3684.378 * uncalibrated *
  34.067
                  3684 VV
                            0.075
                                         4247.008 * uncalibrated *
                  4247 PV
                            0.077
  34.305
                                         6266.455 * uncalibrated *
                  6266 VV
  34.409
                            0.045
                                         4076.316 * uncalibrated *
                  4076 VV
  34.524
                            0.044
                                         4451.854 * uncalibrated *
  35_031
                  4452 BV
                            0.082
                                         10826.04 * uncalibrated *7.4 x 5C =
  <u>35.162-</u>
                 10826 VV
                            0.038
  36_009
                  3832 BV
                            0.078
                                         3831.915 * uncalibrated *
                                                                    -/c,3 x 5≥=
 36.262
                                         8154.344 * uncalibrated *-
                  8154 BV
                            0.050
                                         2848.747 * uncalibrated *
                  2849 VV
                            0.039
                                         14204.95 * uncalibrated *
                 14205 VV
  37.012
                            0.054
                                         2152.781 * uncalibrated *
  37.235
                  2153 VV
                            0.057
                                         2496.751 * uncalibrated *
                  2497 VB
  37.299
                            0.055
                                         2496.382 * uncalibrated *
  37.979
                  2496 BV
                            0.034
                                         2572.499 * uncalibrated *
  38.032
                  2572 VV
                            0.034
                                         10351.14 * uncalibrated * 9,76% 50-488
  576 عـ 38
                  2584 PV
                            0.049
 48.694
                 10351 VV
                            0.042
                                        4369.492 * uncalibrated *
                  4369 VB
                            0.095
  39.021
                                         1676.075 * uncalibrated *
                  1676 PV
                            0.042
  39.682
                                         13999.83 * uncalibrated *
  39.795
                 14000 VV
                            0.050
  39.954
                  1938 VB
                            0.076
                                         1938.080 * uncalibrated *
                  3598 BV
                            0.047
                                         3597.603 * uncalibrated *
  40.485
                                         23094.07 * uncalibrated *
                 23094 PV
                            0.052
  40.680
                                          693.645 * uncalibrated *
                   694 VV
                            0.042
  40.800
                  2151 BV
                                         2151.003 * uncalibrated *
  41.077
                            0.053
                                         10530.55 * uncalibrated *
  42.232
                 10531 BB
                            0.079
```



operator Instrument : 5890-1 Vial Number Sample Name : LNAPL 1:50 Injection Number: 1 Run Time Bar Code: Sequence Line : 1 Instrument Method: RHONE727.M mired on : 26 Jul 93 12:05 PM : RHONE727.M ort Created on: 20 Aug 93 02:01 PM Analysis Method ast Recalib on : 20 Aug 93 01:14 PM Sample Amount : 0 Multiplier ISTD Amount : 1



pata File Name : C:\HPCHEM\1\DATA\RHONE-P\018F0101.D

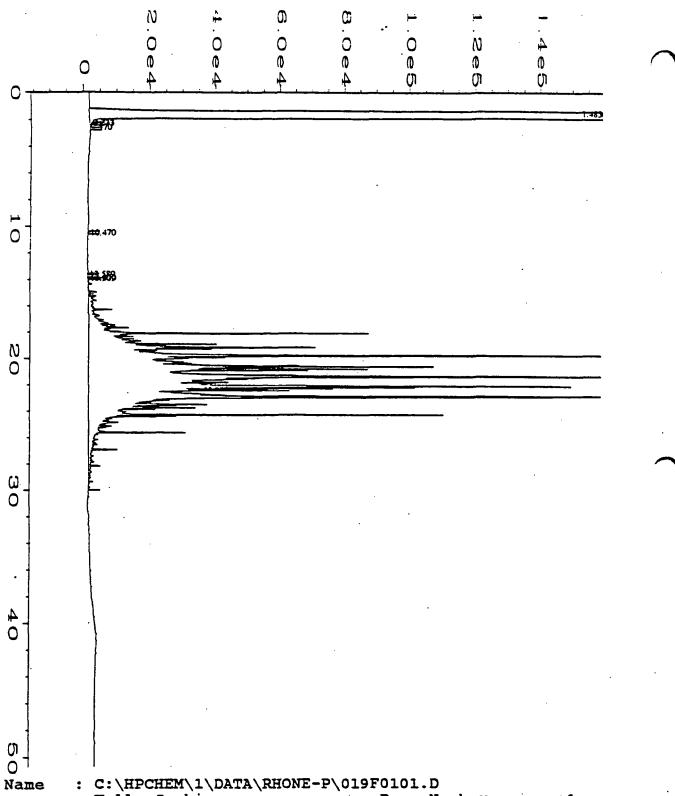
: Kelly Cooki

perator

```
trument
                 : 5890-1
                                               Vial Number
ample Name
                : LNAPL 1:5000
                                               Injection Number: 1
Run Time Bar Code:
                                               Sequence Line
                                                               : 1
                 : 26 Jul 93
Acquired on
                             01:06 PM
                                               Instrument Method: RHONE727.M
Report Created on: 20 Aug 93
                              01:47 PM
                                               Analysis Method : RHONE727.M
Last Recalib on : 20 Aug 93 01:14 PM
                                               Sample Amount
Multiplier
                                               ISTD Amount
ig. 1 in C:\HPCHEM\1\DATA\RHONE-P\018F0101.D
                      Type Width Ref# UG/ML
            Area
                                                            Name
                -----
               191740 BBA 0.031
                                        18.018 Toluene x5000 = 90,090 = 9.01%
                                 1
   3.219
              1791912 BB + 0.000
                                       132.942 WMO x 2 cc = 46.47%
  22.003
                                 1
   1.466 1.1112E+009 BB S 0.193
                                      1.1E+009 * uncalibrated *
                  747 BV T 0.031
                                       747.377 * uncalibrated *
   2.217
  2.261
                 1695 VV T 0.030
                                      1694.728 * uncalibrated *
                  616 VV T 0.030
  2.320
                                       615.958 * uncalibrated *
  2.397
                   51 PB T 0.022
                                        51.462 * uncalibrated *
  2.568
                  952 BB T 0.073
                                       951.946 * uncalibrated *
                 1122 BB
  31.892
                                      1122.497 * uncalibrated *
                           0.052
                 3817 BV
  35.999
                                      3817.461 * uncalibrated *
                           0.036
  38.442
                  817 BB
                           0.039
                                       816.508 * uncalibrated *
```

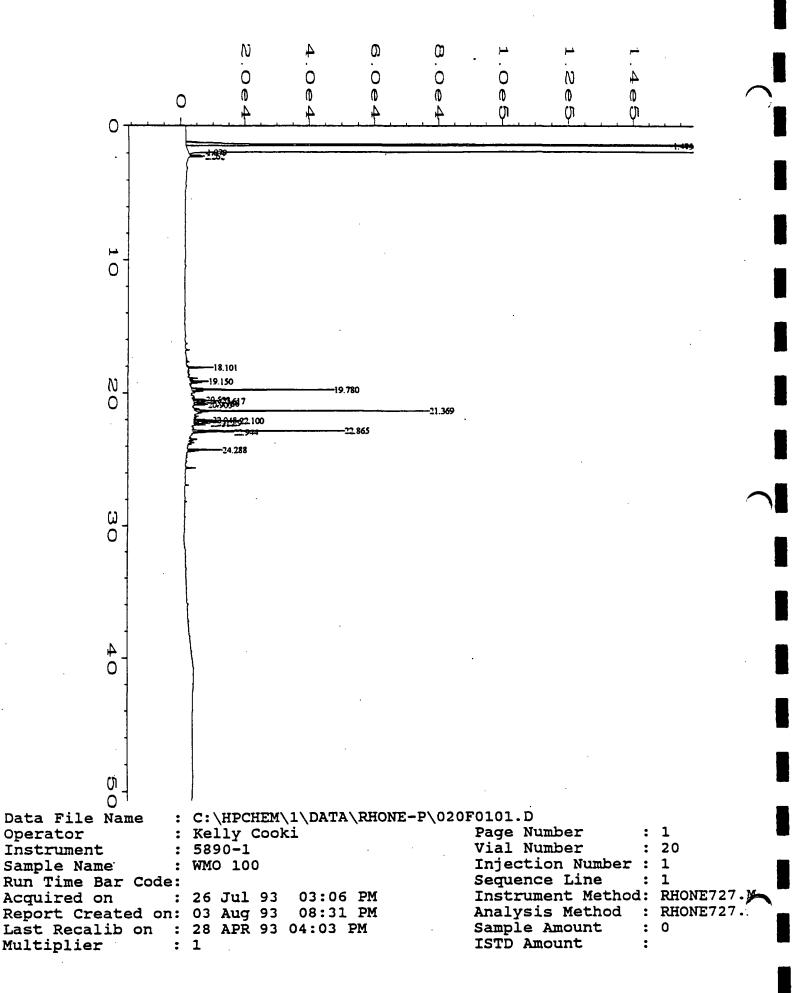
9.01%/c.815 = 11.1% 66.47%/0.815 = 81.6% 92.7%

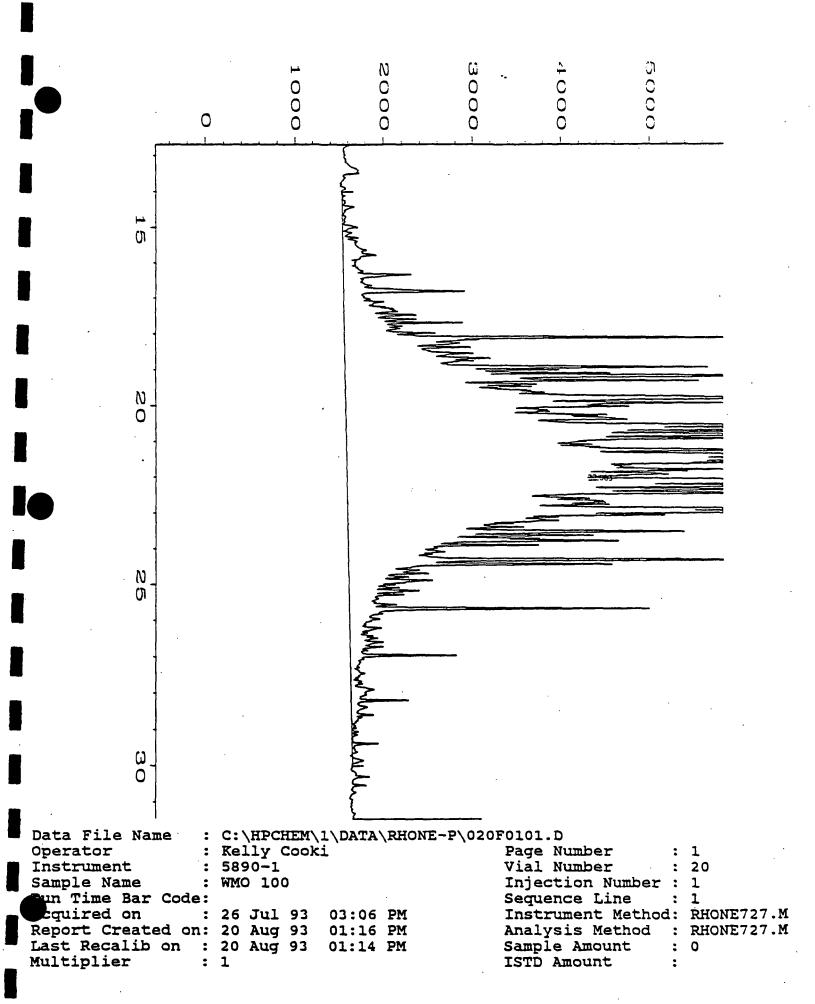
Page Number



```
Data File Name
Operator
                  : Kelly Cooki
                                                 Page Number
                                                 Vial Number
Instrument
                   5890-1
Sample Name
                  : WMO 1000
                                                 Injection Number: 1
Run Time Bar Code:
                                                 Sequence Line
                 : 26 Jul 93
Acquired on
                                                 Instrument Method: RHONE727.M
                               02:06 PM
Report Created on: 20 Aug 93
                                                 Analysis Method
                                                                  : RHONE727.1.
                               02:39 PM
Last Recalib on : 20 AUG 93 01:14 PM
                                                 Sample Amount
                                                                   : 0
                 : 1
                                                 ISTD Amount
Multiplier
```

```
pata File Name : C:\HPCHEM\1\DATA\RHONE-P\019F0101.D
operator : Kelly Cooki
                                             Page Number
                                             Vial Number : 19
  trument : 5890-1
ple Name : WMO 1000
                                             Injection Number: 1
                                             Sequence Line : 1
Run Time Bar Code:
                                           Instrument Method: RHONE727.M
Analysis Method: RHONE727.M
Acquired on : 26 Jul 93 02:06 PM
Report Created on: 20 Aug 93 02:40 PM
Last Recalib on : 20 AUG 93 01:14 PM
                                            Sample Amount : 0
Multiplier
                : 1
                                            ISTD Amount
sig. 1 in C:\HPCHEM\1\DATA\RHONE-P\019F0101.D
Ret Time Area Type Width Ref# UG/ML
                                                         Name
3.300 * not found * 1
22.003 1.55361E+007 BB + 0.000 1
                                             Toluene
                                     1152.626 WMO
  33.288 * not found *
                                             Palatinol DOP
   1.483 1.16156E+009 BB S 0.202
                                     1.2E+009 * uncalibrated *
                                     713.755 * uncalibrated *
   2.233
                 714 BV T 0.029
                                     856.663 * uncalibrated *
   2.273
                 857 VB T 0.036
              1100 BB T 0.074
                                     1100.200 * uncalibrated *
   2.570
  10.470
                3214 BB
                          0.066
                                     3213.839 * uncalibrated *
  13.589
                1944 VV
                                     1944.227 * uncalibrated *
                        0.042
  13.870
               2455 BV 0.041
                                    2455.012 * uncalibrated *
               1780 VV 0.032 1780.286 * uncalibrated *
  13.909
```





```
Data File Name : C:\HPCHEM\1\DATA\RHONE-P\020F0101.D
Operator : Kelly Cooki Page No
                                             Page Number
                                             Vial Number : 20
Instrument : 5890-1
Sample Name : WMO 100
Instrument
                                             Injection Number: 1
Run Time Bar Code:
                                             Sequence Line : 1
Acquired on : 26 Jul 93 03:06 PM
                                             Instrument Method: RHONE727.M
                                          Analysis Method: RHONE727.M
Sample Amount: 0
Report Created on: 20 Aug 93 01:16 PM
Last Recalib on : 20 Aug 93 01:14 PM
Multiplier
                : 1
                                            ISTD Amount
Sig. 1 in C:\HPCHEM\1\DATA\RHONE-P\020F0101.D
Ret Time Area Type Width Ref# UG/ML
                                                          Name
3.348 * not found *
                                             Toluene
  22.003 1603990 BB + 0.000 1
                                     119.000 WMO
   1.474 1.13898E+009 BB S 0.194
                                     1.1E+009 * uncalibrated *
  2.181
                1400 BV T 0.017
                                     1400.209 * uncalibrated *
                551 VV T 0.022
                                     550.597 * uncalibrated *
  2.224
```

5546.873 * uncalibrated * 4952.796 * uncalibrated *

486.579 * uncalibrated *

Not all calibrated peaks were found

2.262

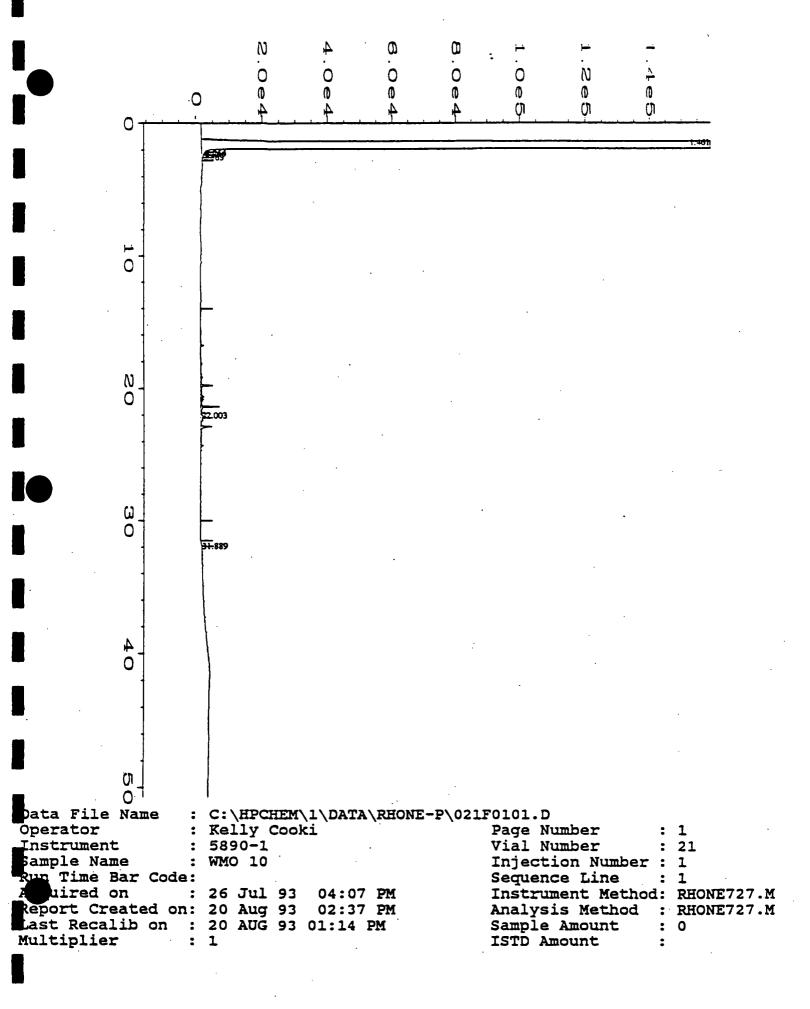
2.320

5547 VV T 0.019

4953 VB T 0.020

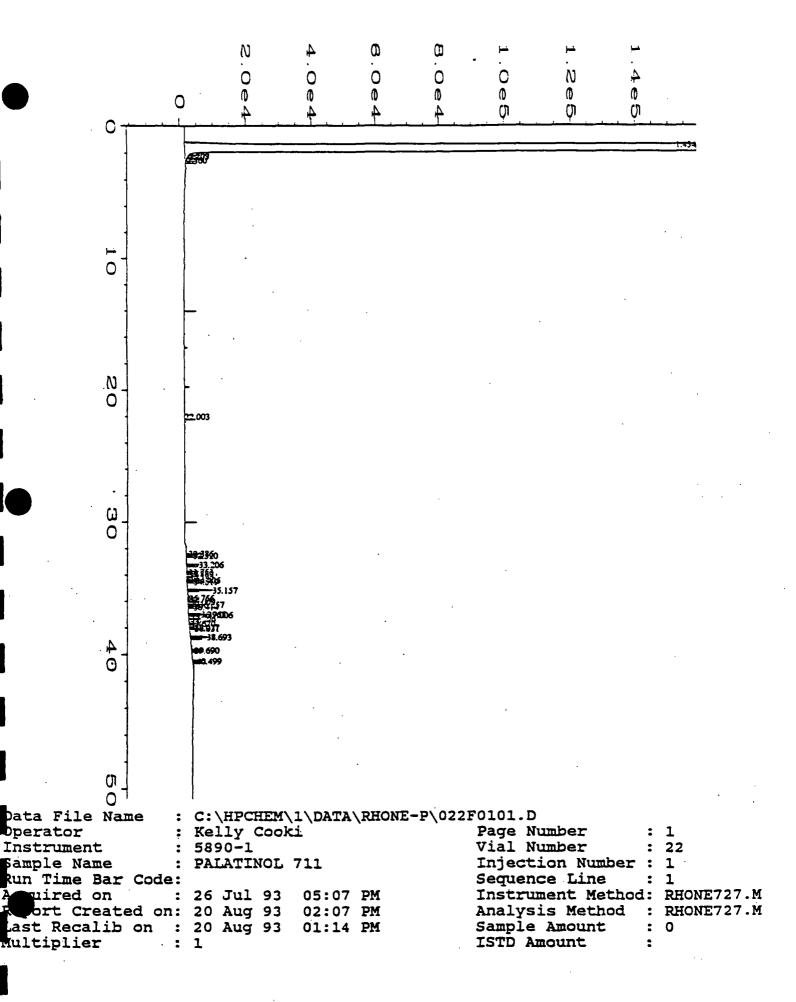
487 BV T 0.050

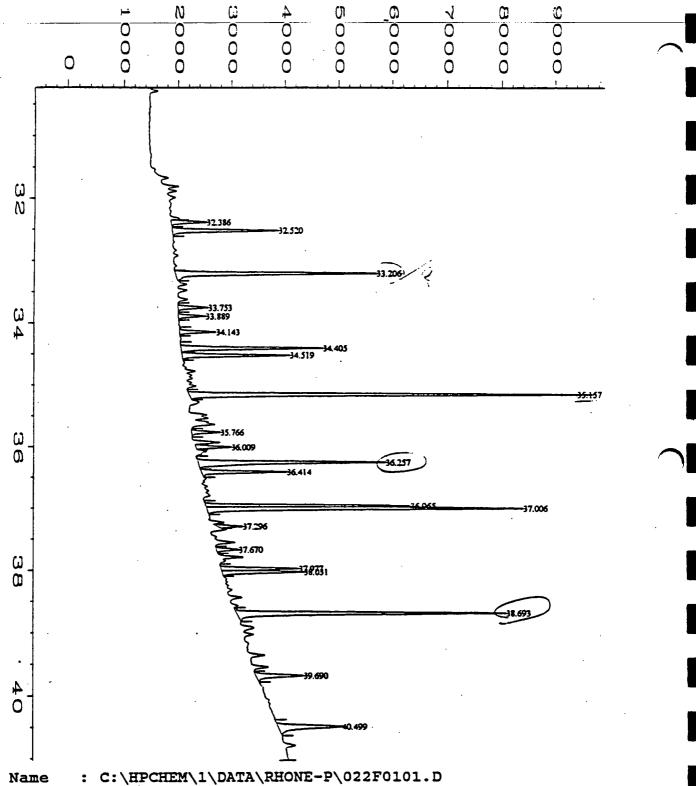
AMT / AREA = 7,41899 X10-5



```
Data File Name : C:\HPCHEM\1\DATA\RHONE-P\021F0101.D
Operator
               : Kelly Cooki
                                                 Page Number
Instrument
                : 5890-1
                                                 Vial Number
                                                                   : 21
Sample Name
                 : WMO 10
                                                 Injection Number: 1
Run Time Bar Code:
                                                 Sequence Line
                                                                : 1
Acquired on : 26 Jul 93 04:07 PM
                                               Instrument Method: RHONE727.M
Report Created on: 20 Aug 93 02:37 PM Last Recalib on : 20 AUG 93 01:14 PM
                                                 Analysis Method : RHONE727.M
                                                Sample Amount
                                                                   : 0
Multiplier
                 : 1
                                                 ISTD Amount
```

Sig. 1 in	n C:\HPCHEM\1	\DATA	\RHONE-	-P\021	F0101.D	
Ret Time	Area		Width		•	Name
		ı				
3.300	* not found	*		1		Toluene
22.003	163593	BB +	0.000	1	12.137	WMO
33.288	* not found	k		1		Palatinol DOP
1.461	1.11272E+009	BB S	0.196		1.1E+009	* uncalibrated *
2.214	825	BV T	0.034		825.234	* uncalibrated *
2.266	1259	VB T	0.045		1259.326	* uncalibrated *
2.398	70	BV T	0.023		69.826	* uncalibrated *
2.563	57	PB T	0.023		57.195	* uncalibrated *
31.889	1230	BB	0.076		1230.487	* uncalibrated *



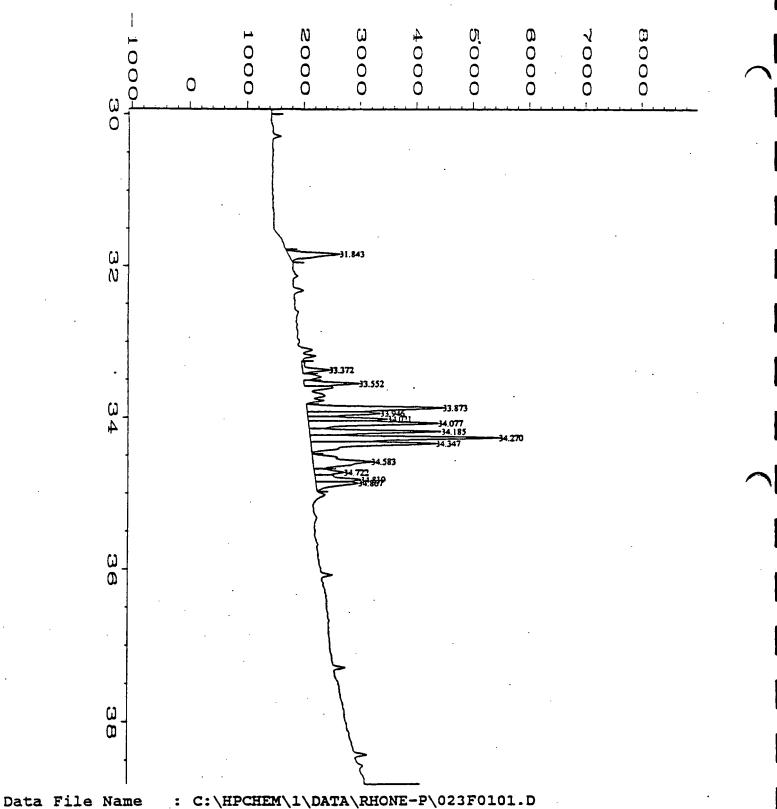


```
Data File Name
Operator
                  : Kelly Cooki
                                                 Page Number
                                                 Vial Number
                  : 5890-1
Instrument
                                                 Injection Number: 1
Sample Name
                  : PALATINOL 711
                                                                   : 1
Run Time Bar Code:
                                                 Sequence Line
                                                 Instrument Method: RHONE727.N
Acquired on
                  : 26 Jul 93
                               05:07 PM
                                                                   : RHONE727.1.
                                                 Analysis Method
Report Created on: 20 Aug 93
                               02:08 PM
                                                 Sample Amount
                                                                   : 0
Last Recalib on
                : 20 Aug 93
                               01:14 PM
                                                 ISTD Amount
Multiplier
                 : 1
```

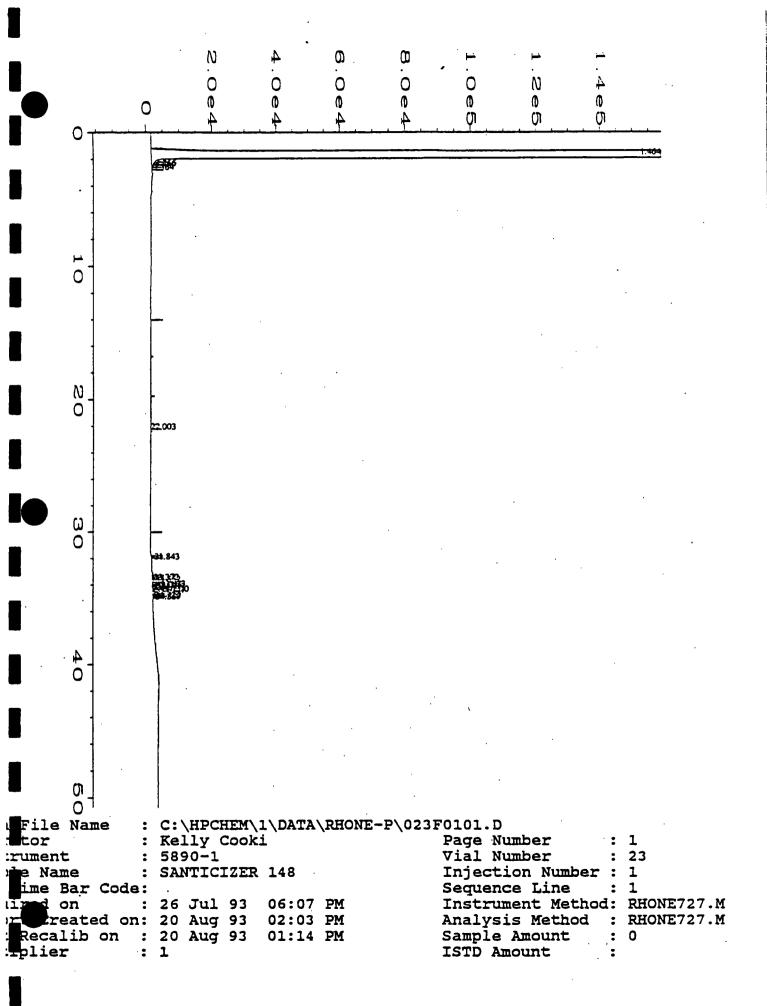
ata File Name : C:\HPCHEM\1\DATA\RHONE-P\022F0101.D

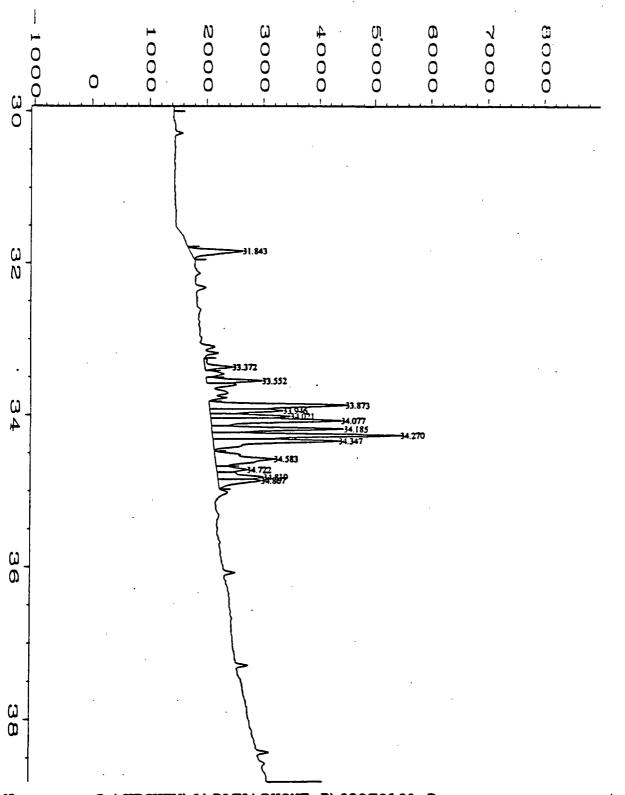
Not all calibrated peaks were found

```
: Kelly Cooki
perator
                                             Page Number
                                             Vial Number
  rument
               : 5890-1
               : PALATINOL 711 12.6 PP
                                           Injection Number: 1
   ble Name
un Time Bar Code:
                                            Sequence Line : 1
                : 26 Jul 93 05:07 PM
                                            Instrument Method: RHONE727.M
Acquired on
Report Created on: 20 Aug 93 02:07 PM
                                           Analysis Method : RHONE727.M
ast Recalib on : 20 Aug 93 01:14 PM
                                            Sample Amount : 0
                                            ISTD Amount
ultiplier
ig. 1 in C:\HPCHEM\1\DATA\RHONE-P\022F0101.D
et Time Area Type Width Ref# UG/ML
                                                         Name
3.300 * not found *
                                             Toluene
                                1
                                       0.955 WMO
               12869 BB + 0.000
 22.003
                                       0.933 Palatinol DOP
 33.206
                9778 BV
                         0.040
  1.454 1.09999E+009 BB S 0.193
                                    1.1E+009 * uncalibrated *
                                    715.832 * uncalibrated *
  2.209
                 716 BV T 0.028
  2.263
                1164 VB T 0.042
                                     1164.137 * uncalibrated *
  2.560
                1310 BB T 0.079
                                    1310.469 * uncalibrated *
 32.386
                1640 VB
                                    1639.588 * uncalibrated *
                         0.037
                                                              ANT /AREA
                4895 BB
                                    4894.618 * uncalibrated *
 32.520
                         0.039
 33.753
               1400 BB
                                    1399.805 * uncalibrated *
                         0.038
                                    1172.026 * uncalibrated *
 33.889
               1172 BB
                         0.035
               1550 BB
                                    1549.711 * uncalibrated *
 34.143
                         0.036
               6709 BV
                                    6708.547 * uncalibrated *
 34.405
                         0.040
 34.519
               4887 VB
                         0.038
                                    4886.715 * uncalibrated * 0.000683
 ر_35.157
              18440 BV
                         0.039
                                    18440.24 * uncalibrated *
   .766
               . 1260 BB
                                    1259.651 * uncalibrated *
                         0.037
   5.009
                1473 VV
                                    1472.901 * uncalibrated *
                         0.035
 36.257
               9982 BV
                         0.043
                                    9982.418 * uncalibrated * 0.00/262
 36.414
               3806 PB
                                    3806.384 * uncalibrated *
                         0.037
               .7718 BV
                                    7717.624 * uncalibrated *
 36.965
                         0.032
               15950 VB
                                     15949.94 * uncalibrated *
 37.006
                         0.041
 37.296
                889 PV
                         0.029
                                     888.909 * uncalibrated *
 37.670
                1008 VB
                                    1008.157 * uncalibrated *
                         0.035
 37.977
               3355 BV
                                    3354.887 * uncalibrated *
                         0.035
                3846 VV
 38.031
                                    3845.953 * uncalibrated *
                         0.038
                                    13364.49 * uncalibrated * 0.000943
 38.693)
              13364 VB
                         0.041
 39.690
               2647 BB
                         0.047
                                   2646.824 * uncalibrated *
 40.499
               4532 BB
                                   4532.034 * uncalibrated *
                         0.056
```



	_	/	/- /	\ \ \ \	 -		
Operator	:	Kelly Cool	ki		Page Number	:	1
Instrument	:	5890-1			Vial Number	:	23
Sample Name	:	SANTICIZE	R 148		Injection Number	:	1
Run Time Bar Code	:				Sequence Line	:	1
Acquired on	:	26 Jul 93	06:07	PM	Instrument Method	l:	RHONE727
Report Created on	:	20 Aug 93	02:05	PM	Analysis Method	:	RHONE727.
Last Recalib on	:	20 Aug 93	01:14	PM	Sample Amount	:	0
Multiplier					ISTD Amount	:	
-							••

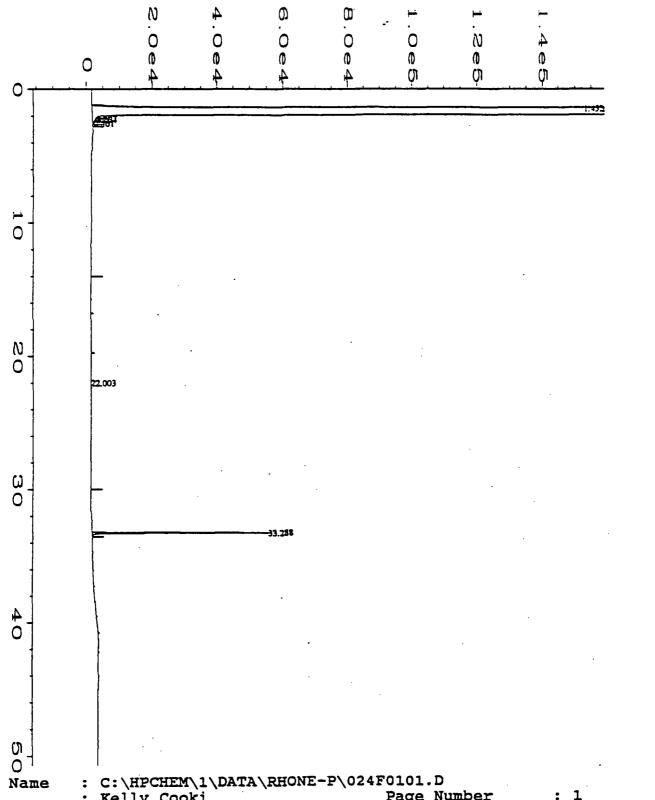




Data File Name	:	C:\HPCHEM\	l/Data	\RHONE-P\023 :	F0101.D		•
Operator	:	Kelly Cook	i		Page Number	:	1
Instrument	:	5890-1		•	Vial Number	:	23
Sample Name	:	SANTICIZER	148		Injection Number	:	1
Run Time Bar Code	:				Sequence Line		
Acquired on	:	26 Jul 93	06:07	PM	Instrument Method		
Report Created on	:	20 Aug 93	02:05	PM	Analysis Method	:	RHONE727
Last Recalib on	:	20 Aug 93	01:14	PM	Sample Amount	:	0
Multiplier	:	1			ISTD Amount	:	

```
Data File Name : C:\HPCHEM\1\DATA\RHONE-P\023F0101.D
Operator
               : Kelly Cooki
                                             Page Number
                                             Vial Number
 trument
               : 5890-1
Sample Name
               : SANTICIZER 148
                                             Injection Number: 1
Run Time Bar Code:
                                             Sequence Line
                                                           : 1
             : 26 Jul 93
Acquired on
                                             Instrument Method: RHONE727.M
                             06:07 PM
Report Created on: 20 Aug 93 02:04 PM
                                             Analysis Method : RHONE727.M
Last Recalib on : 20 Aug 93 01:14 PM
                                             Sample Amount : 0
Multiplier
                                             ISTD Amount
```

			n C:\H	PCHEM\1						
Ret Time Area					Width			Name		
] -				_ '	•			•		Molvey
		.300	* noc	found :				1		Toluene
		.003		-23370					-1.734	
		.372					0.046	1		Palatinol DOP
l	1	.464	1.1203	34E+009	BB	S	0.196		1.1E+009	* uncalibrated *
	2	.216		578	BV	T	0.029		578.361	* uncalibrated *
)	2	.266		1059	VB	T	0.042		1059.115	* uncalibrated *
	2	.398		81	BB	T	0.021		81.165	* uncalibrated *
	2	.564		1279	BV	T	0.079		1279.496	* uncalibrated *
	31	.843		3509	BB		0.056		3508.678	* uncalibrated *
		.552		2572			0.040			* uncalibrated *
		.873		8080			0.051			* uncalibrated *
		.946		3696			0.044			* uncalibrated *
,	34	.021		3661			0.040		3661.082	* uncalibrated *
	34	.077		7620	· VV		0.051		7619.766	* uncalibrated *
	§ 4	.185		6636	VV		0.042		6635.802	* uncalibrated *
	4 .	.270		10006	VV		0.045		10005.62	* uncalibrated *
	34.	.347		8228	VV		0.053		8227.627	* uncalibrated *
1	34.	.583		6041	PV		0.078		6040.723	* uncalibrated *
		.722		1718	VV		0.047			* uncalibrated *
		819		2939			0.051			* uncalibrated *
		.867		2794			0.052			* uncalibrated *
·										•



-			
Data File Name :	C:\HPCHEM\1\DATA\RHONE-P\0241	F0101.D	
	Kelly Cooki	Page Number :	1
		Vial Number :	24
	PALATINOL DOP	Injection Number :	1
Run Time Bar Code:		Sequence Line :	
	26 Jul 93 07:08 PM	Instrument Method:	
		Analysis Method :	
	— J	Sample Amount :	
	20 Aug 93 01:14 PM		J
Multiplier :	1	ISTD Amount :	

zazazazazatan kalende kulon kalende kalende kalende kalende kalende kalende kalende kalende kalende kalende ka

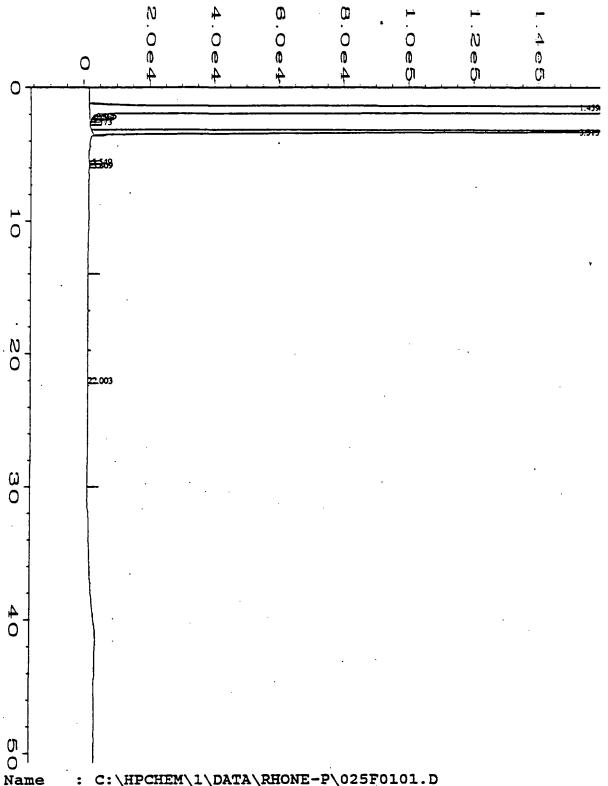
```
Data File Name : C:\HPCHEM\1\DATA\RHONE-P\024F0101.D
Operator
              : Kelly Cooki
                                          Page Number
 strument
              : 5890-1
                                          Vial Number
                                                       : 24
  ple Name
              : PALATINOL DOP
                                          Injection Number: 1
                                          Sequence Line : 1
Run Time Bar Code:
Acquired on : 26 Jul 93 07:08 PM
                                         Instrument Method: RHONE727.M
Report Created on: 20 Aug 93 01:57 PM
                                         Analysis Method : RHONE727.M
Last Recalib on : 20 Aug 93 01:14 PM
                                         Sample Amount : 0
               : 1
                                         ISTD Amount
Multiplier
Sig. 1 in C:\HPCHEM\1\DATA\RHONE-P\024F0101.D
Ret Time Area Type Width Ref# UG/ML
                                                    Name
 3.300 * not found *
                                          Toluene
                              1
  22.003
               6844 BB + 0.000 1
                                    0.508 WMO
  33.288
             133058 BB
                                    12.700 Palatinol DOP
                        0.038 1
   1.452 1.09251E+009 BB S 0.191
                                  1.1E+009 * uncalibrated *
                                 701.781 * uncalibrated *
   2.207
                702 BV T 0.028
   2.264
               1250 VB T 0.042
                                 1250.418 * uncalibrated *
```

1340.926 * uncalibrated *

Not all calibrated peaks were found

1341 BV T 0.077

2.561

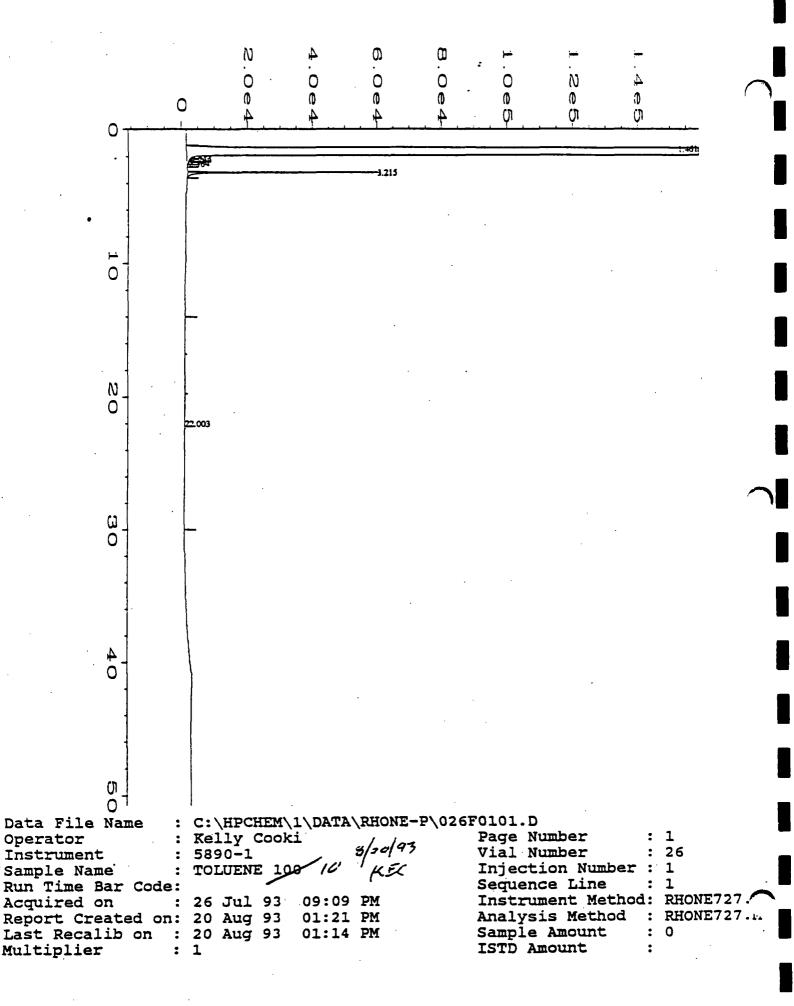


```
Data File Name
                                                 Page Number
Operator
                 : Kelly Cooki
                                                 Vial Number
                 : 5890-1
Instrument
Sample Name
                 : TOLUENE 1000
                                                 Injection Number: 1
Run Time Bar Code:
                                               Sequence Line
                                                                    1
                                                 Instrument Method: RHONE727.
Acquired on
                 : 26 Jul 93
                              08:08 PM
Report Created on: 20 Aug 93
                              01:23 PM
                                                Analysis Method
                                                                  : RHONE727..
                                                Sample Amount
Last Recalib on : 20 Aug 93
                              01:14 PM
                                                ISTD Amount
Multiplier
```

External Standard Report

bata File Name : C:\HPCHEM\1\DATA\RHONE-P\025F0101.D

```
perator : Kelly Cooki
                                            Page Number
               : 5890-1
                                            Vial Number
                                                           : 25
 trument
                                            Injection Number : 1
Sample Name
               : TOLUENE 1000
Run Time Bar Code:
                                                         : 1
                                            Sequence Line
                                            Instrument Method: RHONE727.M
Acquired on
               : 26 Jul 93 08:08 PM
Report Created on: 20 Aug 93 01:23 PM
                                            Analysis Method : RHONE727.M
Last Recalib on : 20 Aug 93 01:14 PM
                                            Sample Amount
                                                           : 0
Multiplier
                                            ISTD Amount
ig. 1 in C:\HPCHEM\1\DATA\RHONE-P\025F0101.D
ket Time
         Area Type Width Ref# UG/ML
                                                        Name
 3.313 1.26714E+007 BBA 0.078 1
                                    1191.203 Toluene
              -2652 BB + 0.000
                                     -0.197 WMO
                                   1.1E+009 * uncalibrated *
  1.459 1.11127E+009 BB S 0.195
                                    1202.992 * uncalibrated *
  2.125
               1203 BV T 0.019
                                    1136.915 * uncalibrated *
  2.214
               1137 VV T 0.044
               1462 VB T 0.043
                                    1461.578 * uncalibrated *
  2.267
                 97 BB T 0.022
  2.397
                                     97.393 * uncalibrated *
  2.573
               1546 BV T 0.069
                                    1546.154 * uncalibrated *
  5.549
                                    2610.957 * uncalibrated *
               2611 BB
                         0.051
  5.809
                                    3818.111 * uncalibrated *
               3818 BB
                         0.061
                 AMT/AREA = 8. 86518 X10-5
```



External Standard Report

```
ata File Name : C:\HPCHEM\1\DATA\RHONE-P\026F,0101.D

perator : Kelly Cooki Page Number : 1

If trument : 5890-1 Vial Number : 26

ample Name : TOLUENE 100 Injection Number : 1

un Time Bar Code: Sequence Line : 1

Acquired on : 26 Jul 93 09:09 PM Instrument Method: RHONE72
```

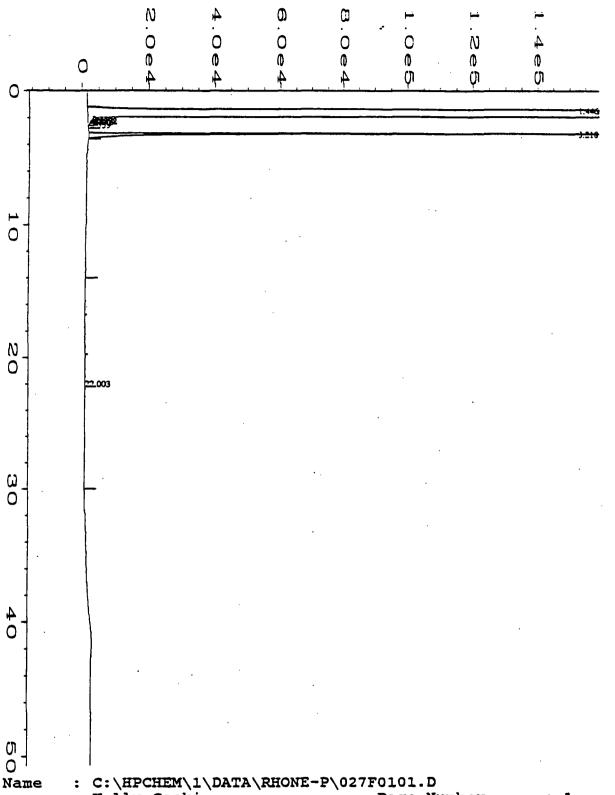
Acquired on : 26 Jul 93 09:09 PM Instrument Method: RHONE727.M Report Created on: 20 Aug 93 01:21 PM Analysis Method : RHONE727.M

ast Recalib on : 20 Aug 93 01:14 PM Sample Amount : 0
Multiplier : 1 ISTD Amount :

ig. 1 in C:\HPCHEM\1\DATA\RHONE-P\026F0101.D Type Width Ref# UG/ML et Time Area Name ------3.348 * not found * Toluene 1 -0.0372 WMO -501 BB + 0.0001.461 1.11292E+009 BB S 0.193 1.1E+009 * uncalibrated * 763.763 * uncalibrated * 764 BV T 0.032 2.215 1325.562 * uncalibrated * 2.264 1326 VB T 0.045 2.398 94 BB T 0.027 94.111 * uncalibrated * 1476 BV T 0.083 1476.459 * uncalibrated * 2.564 123576 BBA 0.031 123576.1 * uncalibrated * 3.215

Not all calibrated peaks were found

AMT / AREA = 10.98 / = 2.98522 × 10-5



Data File Name :	C:\HPCHEM\1\DATA\RHONE-P\027	F0101.D	
Operator :	Kelly Cooki 5890-1 TOLUENE 10/00 KEE	Page Number :	1
Instrument :	5890-1 <i>E/20/43</i>	Vial Number :	
Sample Name :	TOLUENE 10/m, VE	Injection Number:	1
Run Time Bar Code:	- Jac Place	Sequence Line :	
Acquired on :	26 Jul 93 10:09 PM	Instrument Method:	
Report Created on:	20 Aug 93 01:19 PM	Analysis Method :	RHONE727.M
	20 Aug 93 01:14 PM	Sample Amount :	0
fultiplier :	1	ISTD Amount :	

External Standard Report

```
Data File Name : C:\HPCHEM\1\DATA\RHONE-P\027F0101.D
Operator
               : Kelly Cooki
                                             Page Number
                         180 KER 43
strument
                                            Vial Number
              : 5890-1
              : TOLUENE 10
                                           Injection Number : 1
ample Name
                                            Sequence Line : 1
Run Time Bar Code:
                                           Instrument Method: RHONE727.M Analysis Method: RHONE727.M
Acquired on : 26 Jul 93 10:09 PM
Report Created on: 20 Aug 93 01:19 PM
Last Recalib on : 20 Aug 93
                                           Sample Amount
                                                            : 0
                            01:14 PM
                                            ISTD Amount
Multiplier
Sig. 1 in C:\HPCHEM\1\DATA\RHONE-P\027F0101.D
Ret Time Area Type Width Ref# UG/ML
                                                        Name
3.348 * not found *
                                             Toluene
                                1
                                       0.764 WMO
               10296 BB + 0.000
  1.446 1.07764E+009 BB S 0.188
                                    1.1E+009 * uncalibrated *
                  88 BB T 0.022
                                     88.160 * uncalibrated *
  2.116
                 475 BV T 0.018
                                     475.485 * uncalibrated *
  2.171
                614 VV T 0.029
  2.203
                                     614.187 * uncalibrated *
                                    2877.183 * uncalibrated *
                2877 VV T 0.028
  2.252
  2.309
                1586 VV T 0.022
                                   1586.495 * uncalibrated *
  2.389
                111 VB T 0.027
                                    110.664 * uncalibrated *
                1453 BV T 0.076
                                    1453.183 * uncalibrated *
  2.559
             1218840 BBA 0.033
                                    1218840. * uncalibrated *
  3.218
                             AMT /AREA = 0.000000
                         109.8/AREA
Not all calibrated peaks were found
                                            0.0000900857
                                               = 9.00857 X10-5
```

QUALITATIVE DATA



August 5, 1993

CV013522.99

Mr. Kelly Cook
CH2M HILL
2300 N.W. Walnut Blvd.
Corvallis, OR 97330-3538

RE: Analytical Data for Rhone-Poulene, LRD Lab Reference No. 36384

Dear Mr. Cook:

On July 27, 1993, the CH2M HILL Redding Laboratory (LRD) received one sample with a request for analysis of selected organic parameters.

The analytical results and associated quality control data are enclosed. Any unusual difficulties encountered during the analyses of this sample are discussed in the case narratives.

Under CH2M HILL policy, your samples will be stored for up to 30 days after reporting. If you have not given us prior instructions for disposal, we will contact you if any samples require disposal as hazardous waste.

CH2M HILL Laboratories appreciate your business and look forward to serving your analytical needs again. If you should have any questions concerning the data, or if you need additional information, please call our Client Services Representatives, Mr. Mark Cichy or Ms. Mary Paschke, at (916) 244-5227.

Sincerely,

Peggy A. Norton

Senior Data Package Specialist

Enclosures

TABLE OF CONTENTS

CH2M HILL Laboratory Reference No. 36384

•				٠																	Page
List of Organic Data Qualifiers		•				•		•	•								•				<u>No.</u>
List of Sample ID Qualifiers .																					
Client Sample Cross-Reference .	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	iii
SEMIVOLATILE ORGANIC DATA																					
Case Narrative	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	1-2
Analytical Sample Results	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•		•		3-4
Copy of Chain-of-Custody																					. 5

ORGANIC DATA QUALIFIERS

- U Indicates the compound was analyzed for, but not detected. The number adjacent to the "U" qualifier indicates the reporting limit for that compound. The reporting limit can vary from sample to sample depending on dilution factors or percent moisture adjustment when indicated.
- J Indicates an estimated value. It is used when the data indicates the presence of a compound below the stated reporting limit.
- C This flag applies to GC analytes only. The "C" flag indicates the presence of this compound has been confirmed by GC/MS analysis.
- B This flag is used when the analyte is found in the associated blank, as well as the sample. This notation indicates possible blank contamination and suggests the data user evaluate these compounds and their amounts carefully.
- E This qualifier indicates that the value reported exceeds the linear calibration range for that compound. Therefore, the sample should be reanalyzed at an appropriate dilution. The "E" qualified amount is an estimated concentration, and the results of the dilution will be reported on a separate Form I.
- D This qualifier indicates compounds which have been identified during a diluted reanalysis. "D" qualifiers are used for samples that have been analyzed initially at a lesser dilution than required for accurate quantification.

SAMPLE ID QUALIFIERS

The qualifiers that may be appended to the sample ID for organic analyses are defined below:

- DL -- Dilution Run. Indicates the sample contained compounds exceeding the calibration range. The sample was diluted and reanalyzed. Both results are reported.
- R -- Rerun. The sample was reanalyzed. The "R" is not used if the sample was also re-extracted.
- RI -- Re-extraction Analysis. The sample was re-extracted and reanalyzed.
- RD -- Diluted Rerun. The sample was re-extracted and a dilution was also required.
- MS -- Matrix Spike (may be followed by a digit to indicate multiple
 matrix spikes within a sample set)
- MSD -- Matrix Spike Duplicate (may be followed by a digit to indicate
 multiple matrix spike duplicates within a sample set)

CLIENT SAMPLE CROSS-REFERENCE

CH2M HILL Laboratory Reference No. 36384

Client	LRD Lab
Sample ID	Sample ID
528704CVO	36384001

CASE NARRATIVE GC/MS SEMIVOLATILE SAMPLES

CH2M HILL LABORATORIES LABORATORY

RHONE-POULENE CLIENT:

CASE NO. N/A CONTRACT NO.: N/A

LAB REF. NO.: 36384 SDG NO.: N/A

I. RECEIPT

A. Date: July 27, 1993

В. Sample Information:

LAB	CLIENT	Sample	DATE		ANALYSIS
SAMPLE ID	SAMPLE ID	<u>Matrix</u>	SAMPLED		DATE
36384001	528704CVO	SOLVENT	07/26/93	N/A	07/28/93

Documentation

Exceptions : No exceptions were encountered.

II. EXTRACTION

Holding Times: Not applicable.

Extraction

Exceptions : Not applicable.

III. **ANALYSIS**

Holding Times: All holding times were met.

Analytical

Other than a significant level of Toluene, this Exceptions sample contained aliphatic hydrocarbons in the range of ClO - C2O. The majority of the

hydrocarbons fell between C14 -C18.

-00000 916.244.5227 FAX 916.244.4109

5090 Caterpillar Road, Redding, California 96003-1412

SEMIVOLATILE LAB REF. NO. 36384 PAGE 2

- IV. QUALITY CONTROL
 - A. Method Blank: Not applicable.
 - B. Surrogate
 Recoveries: Not applicable.
- V. I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, except for the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

Brian Geers

Manager, Organics Division

ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL, 12b Sample ID: 36384001 Client Sample ID: 528704CVO CH2M HILL/LRD 36384001

Concentration: Sample Matrix: Percent Moisture:

LOW

Date Extracted: Date Analyzed: Dilution Factor:

07/28/93 50

SEMIVOLATILE COMPOUNDS

CAS Number		ng/u	ıL	CAS Number		ng/uL	
62-75-9 108-95-2	N-Nitrosodimethylamine Phenol	500 500	U	87-86-5 85-01-8	Pentachlorophenol Phenanthrene	250 50	
111-44-4	bis(2-Chloroethyl)ether .	500	Ú	120-12-7	Anthracene	50	0 Ū
95-57-8	2-Chlorophenol	500	U	84-74-2	Di-n-butylphthalate .	50	0 U
541-73-1	1,3-Dichlorobenzene	500	U	206-44-0	Fluoranthene	50	
106-46-7	1,4-Dichlorobenzene	500	U	129-00-0	Pyrene	50	
95-50-1	1,2-Dichlorobenzene	500	U	85-68-7	Butylbenzylphthalate .	50	0 U
108-60-1	bis(2-Chloroisopropyl)ether	- 500	U	91-94-1	3,3'-Dichlorobenzidine		
621-64-7	N-Nitroso-di-n-propylamine	500	U	56-55-3 ·	Benzo(a)anthracene		
67-72-1	Hexachloroethane	500	U	218-01-9	Chrysene	50	
98-95-3	Nitrobenzene . '	500	U	117-81-7	bis(2-Ethylhexyl)phthal	late 50	
78-59-1	Isophorone	500	U	117-84-0		50	
88-75-5	2-Nitrophenol	500	U	205-99-2	Benzo(b)fluoranthene .		
105-67-9	2,4-Dimethylphenol	500	U	207-08-9	Benzo(k)fluoranthene .		
111-91-1	bis(2-Chloroethoxy)methane	500	U	50-32-8	Benzo(a)pyrene		
120-83-2	2,4-Dichlorophenol	500	U	193-39-5	Indeno(1,2,3-cd)pyrene		
120-82-1	1,2,4-Trichlorobenzene	500	U	53-70-3		50	
91-20-3	Naphthalene	500	U	191-24-2	Benzo(g,h,i)perylene .	50	0 U
87-68-3	Hexachlorobutadiene	500	υ				
59-50-7	4-Chloro-3-methylphenol .	500	Ü				
77-47-4	Hexachlorocyclopentadiene	500	U				
88-06-2	2,4,6-Trichlorophenol	500	Ü	,			
91-58-7	2-Chloronaphthalene	500	Ü				
131-11-3	Dimethylphthalate	500	IJ				,
208-96-8	Acenaphthylene	500	Ü				
606-20-2 83-32-9	2,6-Dinitrotoluene	500	U U				
51-28-5	Acenaphthene	500 2500	Ü				
100-02-7		2500	Ü				
121-14-2	4-Nitrophenol	500	ŭ		•		
84-66-2	Diethylphthalate	500	ŭ	•			
7005-72-3	4-Chlorophenyl-phenylether	500	ŭ				
86-73-7	Fluorene	500	ŭ				
534-52-1	4,6-Dinitro-2-methylphenol	2500	ŭ				
86-30-6	N-Nitrosodiphenylamine (1)	500	ŭ		·		
122-66-7	1,2-Diphenylhydrazine	500	ŭ				
101-55-3	4-Bromophenyl-phenylether	500	ŭ				
118-74-1	Hexachlorobenzene	500	ŭ				
440-77-1	HEVERHIALABEHFOHE		•				

(1) - Cannot be separated from diphenylamine.
 U - Compound analyzed for but not detected.
 J - Reported value less than quantitation limit.

Form I

000003

916.244.5227

FAX 916.244.4109

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TENTATIVELY IDENTIFIED COMPOUNDS 528704CVO Name: CH2M HILL/LRD Contract: S36384

ab Code: _____ Case No.: <u>S36384</u> SAS No.: _____ SDG No.: <u>GC-MS</u>

atrix: (soil/water) SOLVENT Lab Sample ID: 36384001

ample wt/vol: ____ (g/mL) ng/uL Lab File ID: 93M3BN3569

Date Received: 07/27/93 evel: (low/med) LOW

Moisture: ____ decanted: (Y/N) ___ Date Extracted:

oncentrated Extract Volume: _____(uL) Date Analyzed: 07/28/93

njection Volume: ____1.0(uL) Dilution Factor: 50

PC Cleanup: (Y/N) N pH:

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L ng/ul KEC

E --umber TICs found: 20

CA:	S NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	(
1.	108-88-3	TOLUENE	5.55	45000	J	
2.	6975-98-0	DECANE, 2-METHYL-	18.87	7200	J	İ
3.		UNKNOWN	19.77	2900	IJ	l
4.		UNKNOWN	19.85	5200	J	i
<u>5</u> .	629-62-9	PENTADECANE	20.49	20000	J J	l
		UNKNOWN	20.59	3000	J	l
7.		UNKNOWN	. 20.72	3000	J	l
8.		UNKNOWN	21.15	5100	J J J	ĺ
9.		UNKNOWN	21.25	4300	J	l
10.		UNKNOWN	21.32	2600	J	ĺ
11.		UNKNOWN	21.39	8700	J	ı
	544-76-3	HEXADECANE	22.00	25000	J	ł
13.	į	UNKNOWN	22.07	5000	J	ĺ
14.		UNKNOWN	22.29	3300	J	i
15.	25117-26-4	HEXADECANE, 4-METHYL-	22.75	2900	J J	l
16.		UNKNOWN	22.82	3700	J	ĺ
_	1795-16-0	CYCLOHEXANE, DECYL-	22.89	9000	J	ĺ
18.	629-62-9	PENTADECANE	23.37	32000	J	i
19.	55000-52-7	HEXADECANE, 2,6,10-TRIMETHYL	23.44	13000	J	ı
20.	593-45-3	OCTADECANE	24.65	9200	J	
		· '		•		ĺ

FORM I SV-TIC

3/90

QUALITY ANALYTICAL LABOR.	ATORIES C	HAIN	OF CUSTO	DY RECORE	AND AGI	REEMENT	TO PERF	FORM SER	VICES	
CH2M HILL Project #	Purchase Order #			L/	B TEST CODE	9				LAB USE ONLY
GNE 135 3299								Lab 1#		ab 2 #
Project Name								36	384	p 1 3 3
Rhone - Poulen							ř			# h 7
Company Name/CH2M HILL Office	· <u>L'</u>	-{	}]		$\ \varphi_{s} \ _{\Sigma}^{2}$		Quote #		Kill Hadnest # //
CVO		O			1 6 1 11	564	. .	1 1 K	A Second	
	Report Copy to:	- '		ANA	LYSES REQUE	STED	. 1	Project B	- <u> </u>	1 1 1 1 1 1
Mr. 14- Vall E. Cock	naport copy to.	٦	2					1	26	
Project Manager & Phone 8 Mr. 14 Kelly E. Cock Ma. 1 CVO-X3123		۱ŏ	12				1 1). p	14	Ey av
requested Completion Date: Sampling Ro	equirements Sample Dispos		[3]			}		Ho. of San	nples	Page , bt
SDWA HPDES	RCRA OTHER Dispose Retur		V					1 1		
0/3/93 0 0		_	3		·			# i W	Logid	LMS Ver Xok Ger
Type Mairix		E	"					COC Rey	C. And Co.	
Sampling C G W S	CLIENT SAMPLE ID (9 CHARACTERS)	A	12					The state of		Lan Gi
	(V CHAHACTERS)	٦	EPA							LAB 1 FLAB
Date Time R			13						REMARKS	ID 📜 ID
1/36 0900 52	8704CV	014	×			}				2/13/9 MASS
′ [['		" "			"			
					ار حرا	101/	۔ ام۔ ا		•	7
			Par	inple of	444	1 r h (*	75247	1041		1000
				, ,				[1 1 1
				luteil	1:5	0 W	MEC	CA		148
						1 - 1] []			
, [] 1 1 1 1 1 1 1 1 1			1	Bri		h	1-17	n / J	~	
			ree	1 Pr	an c	CC15	Por	reporte	グ	
					7	[, ,]				12
		1	Need	CODIE	by H	114	lata	4 PADE	nvorle	1 1 1 1 2 7
		1						y sy s	=	1
										13 3
Sampled By & Title (Please sign and plate says	Date/Time		Relinguished	34-2-1	Pign and print name)		/ Da	to/Time	HAZWRAP/NES	I Y N
Kelly E. Cook Kelx	2 Coul 7/26	0900	1//./0	5 Call	Kelly	E. Code	7	26 1100	•	3.7
Received By Please ign and Polisinas	Date/Time		Helinquieted	By (Phone	elgn and print name)		¦15.	ate/Time		2 3 Others
Received By (Please sign see print nee	Date/Time		Relinguished	Ву (Рызи	sign and print name)			ate/Time	Ana Reg	TEMP AND
Received By (Please sign sine print new	`			_• ·	·				Cuel Seal) Ph
Regard By) (Presy lign and print no		2.0	Shipped Via				Shipping #		··	
MICKOLE FORM	a)7/27/98 09	<u>30</u>	UPS BUS	Fed-Ex	Hand Other		<u> </u>			
Work Authorized By O (Please sign and print ne	Remarks			`						
) 1	lana an Bayeran Cide)						<i>)</i>
Instructions and Agreement Provis	ions on Heverse Side.						DIST	TOUR TON:	AL - MARIE	llow Pink

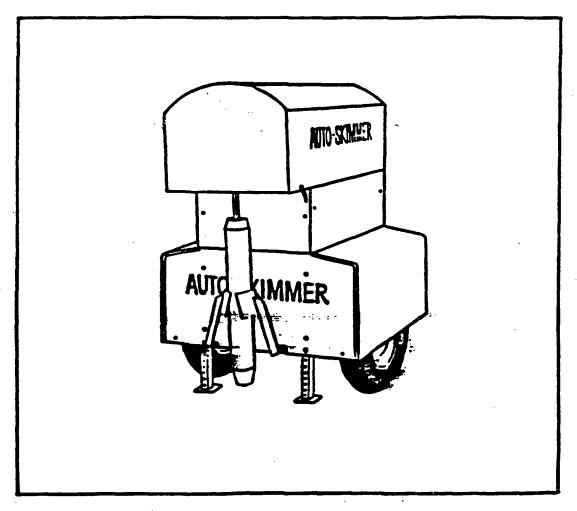
Appendix D

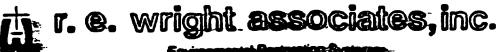
Auto-Skimmer™ Information from R. E. Wright Associates, Inc.

AUTO-SKIMMER

PAT. 4,404,093

OPERATIONS AND SERVICE MANUAL





3240 Schoolhouse Road. Middletown, PA 17057

SECTION I GENERAL OVERVIEW

The REWAI portable AUTO-SKIMMER recovers floating product (hydrocarbons) from the surface of water wells. A completely automated system, the AUTO-SKIMMER works alone or in conjunction with a depression pump. With two modes of operation, the effectiveness of the AUTO-SKIMMER does not diminish with product yield. During the initial recovery period, when a high volume of product is present in the well, the AUTO-SKIMMER can be adjusted to operate continuously. Later when the product influx rate has diminished, the AUTO-SKIMMER may be cycled periodically, allowing time for product to seep into the well.

System operations are controlled by a series of timers which are set to maximize recovery efforts. Once the timers are properly set, the AUTO-SKIMMER can be left to work unattended. The mechanical nature of the AUTO-SKIMMER increases its durability and reliability, since there are no electrical probes in the well to become coated with hydrocarbons and malfunction.

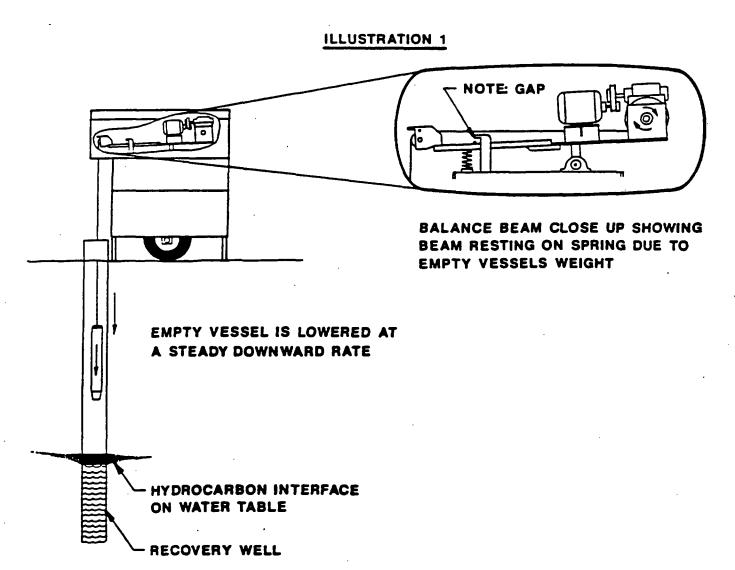
In addition to the standard portable model, the AUTO-SKIMMER is in three component models; as a stationary model, which can be installed either aboveground or concealed below grade, and as a roadworthy trailer model that can be towed anywhere.

Description of Operations

The AUTO-SKIMMER performs two vital functions of the recovery process: First, the system removes fluid from the surface level of the recovery well during the "skimming cycle." Then, the recovered liquid is refined during the "recovery cycle" when the fluid is separated and the product is removed from the water.

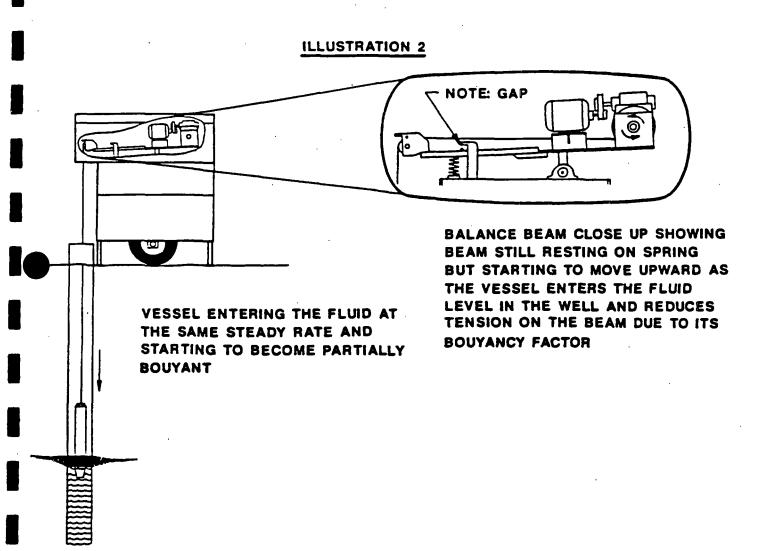
The Skimming Cycle

The skimmer vessel is initially lowered into the well by the winch and control arm assembly at a steady rate of approximately 25 feet per minute (Ill. 1).

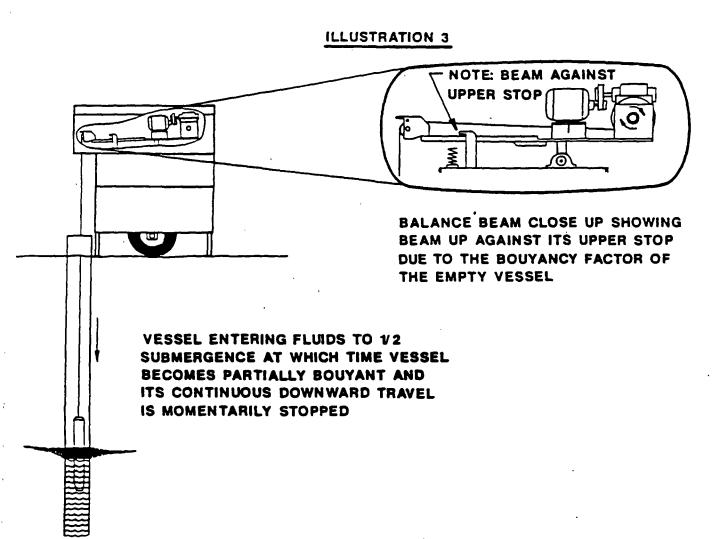


AUTO2

Upon reaching the fluid level in the well, the empty vessel becomes partially buoyant (III. 2).



Once buoyant, the vessel no longer exerts a downward force on the assembly, causing the control arm to rise and activate a limit switch. This switch temporarily stops the descent of the vessel (Ill. 3).

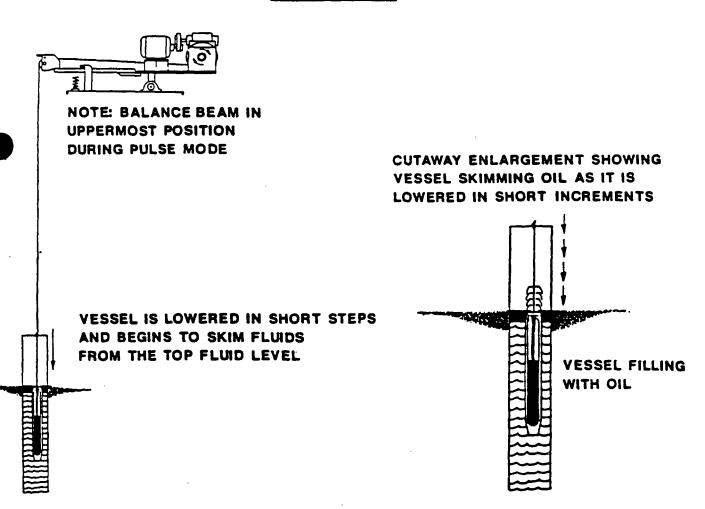


AUTO2

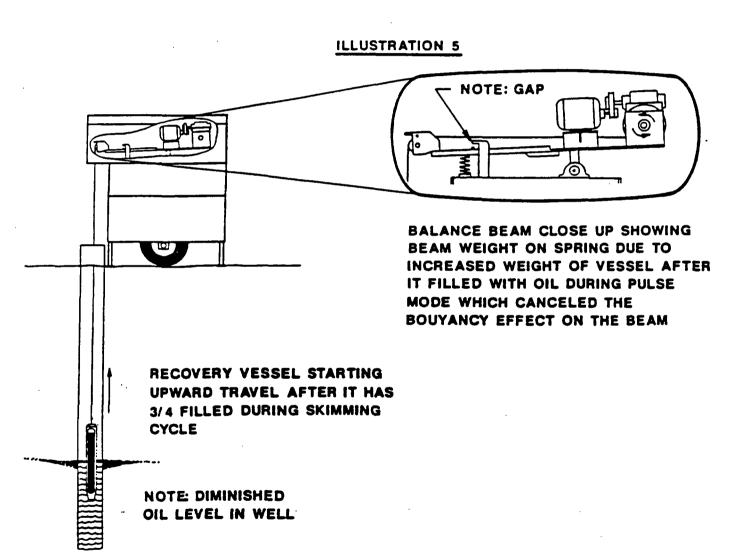
When the downward movement of the vessel begins again, it is lowered through a series of pulses, which occur at a steady rate.

As this downward pulsing action continues, the open top of the vessel is submerged below the fluid level in the well and fluid begins to flow into the container (Ill. 4).

ILLUSTRATION 4

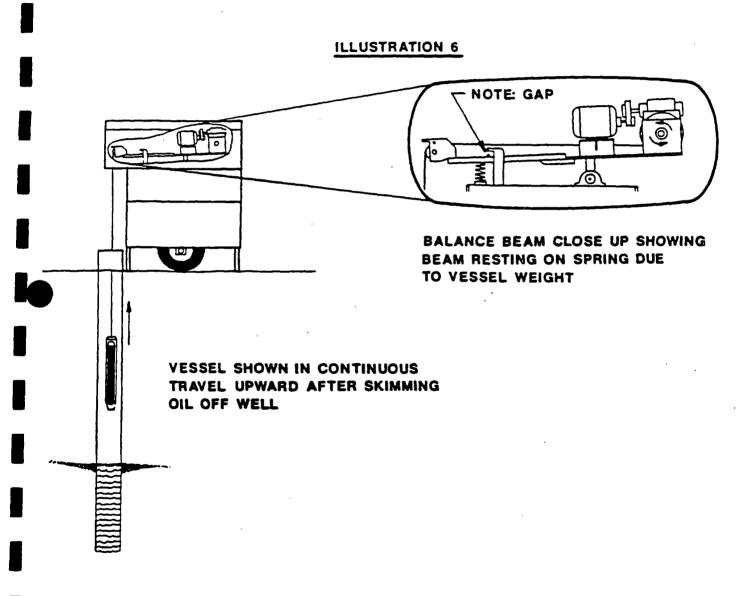


With the weight of the liquid, the vessel exerts a downward force on the assembly, pulling down the control arm. When the vessel becomes approximately three-quarters full, the control arm reaches its lowest level and activates an upward limit switch (Ill. 5).



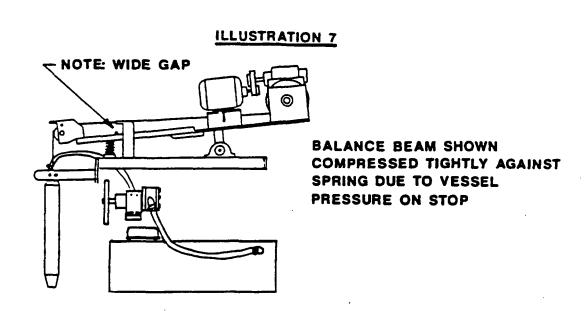
AUTO2

This initiates the ascent of the vessel to ground surface (Ill. 6).



The Recovery Cycle

When the vessel returns to its starting position, its contents are pumped into the AUTO-SKIMMER's built-in oil/water separator. The product is removed from the water and pumped to a collection tank. The water can either be returned to the well or transferred to a surface container, contingent on applicable local regulations (Ill. 7).



VESSEL AS SHOWN INDICATES THE END OF THE SKIMMING CYCLE DURING WHICH TIME THE VESSEL CONTENTS ARE PUMPED OUT AND THE VESSEL WILL CYCLE IMMEDIATELY OR WAIT AS DEPENDENT ON WHETHER THE AUTO-SKIMMER IS SET TO RUN CONTINUOUSLY OR ON TIMED FUNCTION

Operating Cycles

To maximize the effectiveness of the AUTO-SKIMMER, you determine how often the system should operate relative to the amount of product present in the well or the well yield: in the Continuous Mode or in the Timed Interval Mode with up to 30 hours between cycles.

In addition, you control the length of the downward <u>pulse</u> and the duration of the <u>pause</u> between pulses during the Skimming Cycle. The length of the downward pulse can be as short as one-eighth of an inch, and duration of the pause between pulses can range from one-tenth of a second to 30 seconds or more (see Section III, "Setting Timers").

Water Level Fluctuations

Because its operation is triggered by the buoyancy of the empty recovery vessel, the AUTO-SKIMMER recovers product in situations marked by changing liquid levels. The AUTO-SKIMMER reliably adjusts to any change in liquid level resulting from tidal, seasonal, or storm events. Even periodic cycling of pumps in nearby wells or an optional water table depression pump in the same well will not affect the AUTO-SKIMMER's ability to remove product from the fluid level.

No adjustments are required for any variations in the depth to the product level or fluctuations in water level, a feature that can produce considerable savings on sites where the AUTO-SKIMMER is being moved from well to well.





ARCADIS Geraghty & Miller Inc 8330 154th Avenue N.E. Redmond Washington 98052-3864 Tel 425 869 6321 Fax 425 869 6369

ENVIRONMENTAL

Ms. Sylvia Burges U.S. Environmental Protection Agency 1200 Sixth Avenue Seattle, Washington 98101

Subject:

Revised Interim Measures Workplan

Dear Ms. Burges:

Please find enclosed three copies of the above-referenced document for your review. This submittal provides an overview of the proposed interim measures (IM) and detailed information regarding pilot testing of the proposed technologies.

As stated in your December 22, 1997 letter to Mr. Edwin Liu of Rhodia Inc., the draft plan submitted on December 1, 1997 was largely consistent with the requirements for this deliverable. Minor revisions have been made in this version to address EPA's preliminary comments on the December 1, 1997 draft. The following table identifies the Workplan elements required in the December 22, 1997 EPA letter and corresponding document sections.

Redmond, Washington, 12 February 1998

Contact: Jay Bower

Extension: 425-869-6321

Workplan Element	Workplan Section
Interim Measure Description and Objectives	Section 1
Data Collection Quality Assurance Plan	Section 3.6
Data Management Plan	Section 3.6
Pilot Study Plan	Section 3.2
Project Schedule	Section 4
Reporting Requirements	Section 3.7

ARCADIS GERAGHTY& MILLER

Rhodia Inc. is prepared to implement pilot testing for the proposed IM upon EPA approval of this Workplan. Please contact Mr. Liu at 732-821-3325 with any questions regarding the Workplan.

Sincerely,

ARCADIS Geraghty & Miller Inc.

Jay P. Bower, P.E. Principal Engineer

♥. Steve Reed Vice President

Copies:

Byung Maeng

INTERIM MEASURES WORKPLAN

RPI MARGINAL WAY FACILITY TUKWILA, WASHINGTON

PROJECT NO. WA000373.0001

February 1998

Prepared for

Rhodia Inc. (formerly Rhône-Poulenc Inc.) CN 7500 Cranbury, NJ 08512-7500

Prepared by

ARCADIS GERAGHTY & MILLER, INC.

Environment & Infrastructure
8330 154th Avenue Northeast
Redmond, Washington 98052-3864
(425) 869-6321

INTERIM MEASURES WORKPLAN

RPI Marginal Way Facility Tukwila, Washington

PROJECT NO. WA000373.0001

February 1998

Prepared by ARCADIS GERAGHTY & MILLER, INC.

Lexie L. Jones, EIT Engineer

Jay P. Bower, P.E.

Principal Engineer/Project Manager

V. Steve Reed

Vice President/Project Officer

CONTENTS

1. 0	INTRODUCTION1-	-1
1.3	INTERIM MEASURES OBJECTIVE1-	-1
1.2	PROJECT HISTORY AND PRESENT CONDITIONS1-	-2
1.3	SUMMARY OF PROPOSED INTERIM MEASURES1-	-2
2. 0	PROJECT APPROACH2-	-1
2.1	DESCRIPTION OF AS/SVE TECHNOLOGY2-	-1
2.2	2 AQUIFER PROPERTIES2-	.2
2.3	3 CONTAMINANT PROPERTIES2-	.2
3. 0	INTERIM MEASURES	-1
3.1	PERMITTING	-1
3.2	2 PILOT TEST	-1
3.3	FULL SCALE DESIGN	.7
3.4	FULL SCALE IMPLEMENTATION	.7
3.5	DATA ANALYSIS/ EVALUATION CRITERIA3-	.9
3.6	DATA COLLECTION QUALITY ASSURANCE AND DATA MANAGEMENT3	.9
3.7	7 REPORTING	.9
4. 0	SCHEDULE4-	1
5. 0	REFERENCES5-	.1

TABLE

1. Summary of Monitoring Parameters

FIGURES

- 1. Pilot Test Well Locations
- 2. Well Construction Details
- 3. IM System Conceptual Layout
- 4. Preliminary Schedule

1.0 INTRODUCTION

Rhodia Inc. (Rhodia) is currently conducting corrective action activities at the RPI Marginal Way Facility in Tukwila, Washington (the Facility) under an Administrative Order on Consent (Consent Order No. 1091-11-20-3008(h)). Paragraph 6.2 of the Consent Order requires that RPI "continually evaluate available data and assess the need or opportunity for interim measures throughout the duration" of the Consent Order.

Interim measures are defined in the Consent Order as "those actions required in advance of selection of the final corrective action for a facility and which are necessary to expeditiously initiate clean-up actions at a site and control or eliminate the release or potential release of hazardous wastes or hazardous constituents at or from the facility." Neither the Interim Measures Assessment Report, nor the groundwater sampling results prior to 1997 identified a need to implement interim measures. However, groundwater sampling results for October 1997 indicate that toluene may have migrated to Monitoring Well DM-8.

Based on the October 1997 data, RPI has decided that it is appropriate to initiate interim measures to mitigate the potential migration of toluene to the waterway. Paragraph 6.7 of the Consent Order requires that RPI submit a written request to EPA for review and approval of proposed interim measures. This document provides the basis for EPA's review.

1.1 INTERIM MEASURES OBJECTIVE

The primary objectives of the IM described in this Workplan are to mitigate the migration of toluene into the Duwamish Waterway and to ensure that groundwater discharging to the Duwamish Waterway meets applicable Surface Water Standards (for toluene).

Site activities conducted during the implementation of IM will focus on *in situ* enhancement of the degradation of toluene in the saturated and vadose zones between source areas of the toluene plume and the Duwamish Waterway.

1.2 PROJECT HISTORY AND PRESENT CONDITIONS

Site conditions at the RPI Facility have been evaluated using subsurface investigation techniques and are summarized in the RFI report (CH2M Hill 1995). Toluene is present in the groundwater and has been found in a floating light non-aqueous phase liquid (LNAPL) layer located near the center of the plume. The LNAPL has been identified as Penetec oil. During the most-recent groundwater sampling event (October 1997), dissolved toluene was detected in monitoring well DM-8 at a concentration of 8,200 micrograms per liter (µg/l). It appears that toluene represents the sole constituent of concern in regard to the need for IM. The potential for migration of dissolved toluene into Duwamish Waterway is the driving force for IM.

Concurrent with development of this Workplan, additional groundwater investigation activities have been conducted at the site. Rhodia initiated a program to further delineate the extent of the dissolved toluene plume both vertically and horizontally. The program included groundwater sampling with the GeoProbeTM sampling system. Groundwater samples were collected from discrete locations in the aquifer. The results of the GeoProbeTM sampling activities will be used to assist in the design of the IM system.

1.3 SUMMARY OF PROPOSED INTERIM MEASURES

The IM prescribed for this site is a program of biosparging, air sparging, and soil vapor extraction designed to meet the objectives listed above. Generally, biosparging is the process of injecting clean, compressed air into the subsurface, below the groundwater table, to stimulate the biodegradation of organic compounds

by increasing the amount of oxygen available in the local environment. Air sparging (AS) is similar to biosparging, but at significantly higher air flow rates. The objectives of air sparging are to strip (volatize) dissolved contaminants from the groundwater as well as to stimulate the biodegradation of organic contaminants. Soil vapor extraction (SVE) is the process of extracting vapors from the vadose zone to remove volatile contaminants in the soils and soil vapor. SVE also increases oxygen concentrations in the vadose zone and stimulates biodegradation. AS in conjunction with SVE is particularly suitable in systems with an unconfined aquifer and a vadose zone that is amenable to vapor extraction.

The IM will stimulate the biodegradation of dissolved toluene and dissolved and adsorbed organic mass in the saturated (and to some extent the unsaturated) zone by providing necessary environmental conditions in the subsurface. The primary mechanism for creating an environment amenable to the degradation of the toluene will be introduction of air (specifically oxygen) into the groundwater with an air sparging system. The injected air will travel upward through the saturated zone and be collected from the vadose zone. The assimilative capacity (the total mass of organics which the formation is capable of degrading, both aerobically and anaerobically) of the groundwater system is currently limited with respect to the observed toluene concentrations (Appendix A) and introduction of oxygen to the groundwater via air sparging will enhance the assimilation capacity of the groundwater system, thereby mitigating potential impacts to the Duwamish Waterway.

2.0 PROJECT APPROACH

The IM will be implemented in a phased approach as follows:

- Pilot Test. A portion of the air sparging/vapor extraction system will be
 installed for the purpose of conducting a pilot test. A pilot test will be
 conducted to collect the necessary data for design of the full-scale IM system.
- IM System Design. The pilot test data will be evaluated to determine the design criteria for the full-scale IM system. Based on the pilot test data evaluation, the specifications for the full-scale IM system will be developed and incorporated into a work plan for implementation of the IM design (IM Implementation Workplan).
- <u>Full Scale Implementation</u>. The full-scale IM system will be installed and
 tested against design expectations. The system operating conditions will be
 "tuned" to optimize system performance. The IM system will be monitored
 during operation to evaluate and document IM system effectiveness.

2.1 DESCRIPTION OF AS/SVE TECHNOLOGY

Air sparging and biosparging are *in situ* mass-transfer techniques that can successfully degrade and remove hydrocarbon constituents adsorbed in the saturated zone and dissolved in groundwater. The natural degradation of hydrocarbons is stimulated by increasing the available oxygen in the groundwater and vadose zone via the injection of air into the subsurface. Clean, compressed air is injected into the saturated zone by a network of specially designed injection wells. Oxygen diffuses from the air to the groundwater, increasing dissolved oxygen (DO) concentrations, which in turn stimulates aerobic degradation. Also, as the air rises through the saturated zone, dissolved hydrocarbons diffuse from the groundwater to the air

bubbles and channels (volatilization). When the hydrocarbon-laden air reaches the unsaturated zone above the water table, it is collected by a SVE system.

2.2 AQUIFER PROPERTIES

Proper design of AS and SVE systems is essential to prevent spreading of impacted groundwater and to ensure maximum efficiency of the remediation system. The target zone for the IM is the upper aquifer, as defined in the RFI. A review of the existing data, provided in the RFI, indicates the following:

- The vadose zone, which is composed of silty sand and sandy silt, is approximately 10 to 15 feet thick, depending on surface topography.
- The uppermost water-bearing zone, which is under water table (unconfined) conditions, is approximately 40 to 50 feet thick (extending from the water table to approximately 50 to 60 feet below land surface).
- The uppermost water-bearing zone is underlain by a silt and clay aquitard.

2.3 CONTAMINANT PROPERTIES

Toluene is a simple aromatic hydrocarbon that is readily degradable by naturally occurring bacteria in soil and groundwater systems, under both aerobic and anaerobic conditions. Conditions at the Tukwila site that affect degradation rates and inhibit natural degradation are described in Appendix A.

3.0 INTERIM MEASURES

This section describes the tasks to be performed during implementation of the IM Workplan. The schedule for implementation is provided in Section 4.

3.1 PERMITTING

A Notice to Construct and Application for Approval will be submitted to the Puget Sound Air Pollution Control Authority (PSAPCA) prior to installation of the full scale Interim Measures remediation system. The application will be based on the information collected during the pilot test (see below). PSAPCA does not require a permit to perform pilot testing activities.

3.2 PILOT TEST

Prior to installation of the full scale IM, a field design test (pilot test) will be conducted to collect the data necessary for properly designing and installing the components of the system, including the wells, piping network, and equipment. The pilot test procedures described herein outline the objectives, methodology, and the data that will be collected during the design test and were based on the information available in the RFI report (CH2M Hill 1995).

3.2.1 OBJECTIVES

The objectives for the pilot test are as follows:

• Installation of three AS test wells and one SVE Well (Figure 1) to supply a means of air injection/extraction and to provide the information necessary to complete the SVE/AS pilot test and for incorporation into the IM. The test wells are located in an area downgradient of the (suspected) LNAPL plume and upgradient of the Waterway. The locations have also been selected for later incorporation into the full scale system.

Operate the SVE/AS pilot system to obtain the site specific engineering
parameters required to design the IM prescribed for this site. The engineering
parameters targeted by the pilot test are: radii of influence for both the AS and
SVE wells and toluene mass recovery and biodegradation potentials for both
dissolved and residual phase constituents.

3.2.2 TECHNICAL APPROACH

A total of 4 wells will be installed for the pilot test, one SVE well and three AS wells. In addition, two of the AS Wells will be equipped with three monitoring probes each, that will be installed at various depths in the AS well borehole. Figure 2 provides typical well construction details. The specifications of the wells and the equipment to be used during the pilot test are based on information provided in the RFI report and on previous experience with similar projects.

The SVE well will be installed in the vadose zone, to a depth of approximately 13 feet below land surface (bls). The exact depth will be determined by a field geologist during well installation. The SVE well will be constructed of 2-inch diameter polyvinyl-chloride (PVC) screen and riser. The well will be screened with 0.020-inch slotted PVC well screen from approximately 3 to 13 feet bls. The annular space around the well screen will be backfilled with 10-20 colorado silica sand or equivalent. The proposed SVE well is expected to be fully compatible for use with the full scale IM system.

The AS wells will be installed to a total depth of approximately 35 to 40 feet bls. Exact depths will be determined by a field geologist during well installation. Installation of the AS well to this depth will allow the air to travel through the majority of the impacted groundwater to maximize the effectiveness of the system. The AS wells will be completed with 2-foot long, 1¼-inch diameter stainless steel well points installed from approximately 33 to 35 feet bls. The annular space from approximately one foot above the top of the well screen to approximately 10 feet above the top of the well screen will be backfilled with bentonite to create a seal

around the well point. The annular space around the well screen and the annular space around the remainder of the well riser will be backfilled with 10-20 colorado silica sand, to facilitate the even dispersion of air to the aquifer and accommodation of the monitoring probes (see below). The proposed air sparging wells will be fully compatible for use with the full scale IM system. The surface seal for each AS well will be bentonite with a surface monument set in concrete.

Three monitoring probes each will be installed on two of the AS Wells. Each monitoring probe will consist of an AMSTM Gas Vapor Probe Tip (or equivalent) secured to the AS Well riser and connected to ¼-inch Teflon tubing extending to the surface (see Figure 2). The monitoring probes, two in the vadose zone and four in the saturated zone, will be used to collect vacuum and dissolved oxygen concentration measurements, respectively.

3.2.2.1 EQUIPMENT SETUP AND BACKGROUND SAMPLE COLLECTION

The equipment setup will take place at least one day before the start of the pilot test. Equipment setup comprises:

- installation of temporary piping and monitoring devices (pressure/vacuum gauges),
- measurement of exact inter-well distances,
- collection of initial parameter values (Table 1),
- calculation of initial test flow rates (for AS) from depth to water measurements (see below), and
- testing of all equipment.

Prior to performing the pilot test, groundwater samples will be collected from Monitoring Well MW-17, which is located within the impacted portion of the aquifer. The sample will be analyzed to determine initial groundwater chemistry, including dissolved oxygen concentrations, pH, oxidation-reduction potential, conductivity, metals concentrations, hydrocarbon concentrations, and alkalinity.

The entire pilot test will be conducted over a period of approximately 48 to 72 hours and will consist of two phases. The first phase will involve SVE only, and the second phase will involve SVE in conjunction with air injection (air sparging). During the second phase, air will be injected at a minimum of two different pressure/flow rates. Throughout the test, system parameters such as flow rates, induced vacuums and pressures, and hydrocarbon concentrations in extracted vapors will be monitored and recorded. In addition, field conditions such as barometric pressure, temperature, weather, and any other relevant data will be monitored and recorded.

During the first phase of the test, vapors will be extracted from the newly installed SVE wells for a period of approximately 24 hours. In the second phase of the test, SVE will be augmented with low-flow air sparging (biosparging) in the new injection well at the primary injection rate (defined below) for approximately 24 hours followed by 24 hours of air sparging at the secondary (higher) injection rate.

3.2.2.2 PHASE I: SVE ONLY

After the equipment has been installed and tested for proper operation, vapor extraction will be initiated. The initial extraction vacuums are expected to be approximately 70 standard cubic feet per minute (scfm) from the SVE well. This flow rate is based on a review of the lithology of the site and on past experience with similar systems. One of the objectives of the test is to determine the specific flow rates at which the IM system will operate. The actual vacuums and flow rates at which soil vapors will be extracted during the test will be dependent on blower capabilities and the apparent areal extent of vacuum influence of the pilot system. The intent of adjusting SVE flow rates is to optimize the toluene removal rate from the areas of the site where the toluene concentrations are the greatest, thereby expediting overall site remediation.

Once a stable extraction rate has been established (estimated for the purposes of this Workplan at approximately 4 hours), the parameters will be monitored as per Table 1 and a sample of the extracted vapors will be collected for laboratory analysis. Table 1 contains a list of field monitoring parameters, sample collection points and analyses, and monitoring and sampling frequencies. The following table presents the type and purpose of data to be gathered.

PARAMETER	PURPOSE
Water level elevations in the vapor extraction well, air sparging wells, and Monitoring Well 17	Determine the extent of local water mounding and screen available for SVE
Vacuum at the extraction well, and in the monitoring probes in the vadose zone	Determine the areal extent of soil vapor extraction ¹
Air flow rates at the vapor extraction well	Determine the recovery rates and pore volume exchange
Total volatile hydrocarbons in the extracted vapors	Monitor recovery rates
Oxygen, methane, and carbon dioxide concentrations in the extracted vapors	Measure biodegradation activity and potential

3.2.2.3 PHASE II: SVE AND AS

Clean, oil-free, compressed air will be injected into the one of the AS wells. Air will initially be injected at a pressure equal to the calculated breakthrough

¹ For the purpose of this Workplan, the extent of SVE influence is defined as the area in which a vacuum of at least 0.10 inches of water column is induced.

pressure of the water column in the well (measured depth of water in feet times 0.43 pounds per square inch [psi] per foot of water column). For an estimated groundwater depth of 10 feet, the calculated breakthrough pressure would be 4.3 psi. If the resulting flow rate, once stabilized, is less than 2 cfm, the injection pressure will be increased by 10 to 20 percent of the breakthrough pressure until a minimum flow rate of 2 cfm or a maximum of two times the breakthrough pressure is achieved. The pressure will be adjusted to accommodate changes in the pressure required to maintain a stable flow of at least 2 cfm. Once a stable air flow (primary injection pressure and flow rate) is established, field monitoring and sampling will proceed as per Table 1. The anticipated primary injection flow rate is anticipated to be 2 to 4 cfm based on our experience on similar projects.

In addition to the above-mentioned parameters, several other parameters will be monitored during air injection. These parameters are also listed in Table 1 and include the following:

PARAMETER	PURPOSE
Pressure and flow rate of injected air.	Determine full-scale equipment specifications
Positive pressure and dissolved oxygen concentrations at saturated zone monitoring probes	Determine area of influence of the sparging system ²
Elevation of water table (if any) in Monitoring Well MW-17 or in any nearby wells	Determine the length of well screen in vadose zone available for SVE.

² For the purpose of this Workplan, the extent of AS influence is defined as the area in which a pressure of at least 0.10 inches of water column is induced, or the area in which a significant increase in dissolved oxygen concentrations is observed.

After the air injection rates have stabilized for approximately 2 hours, a second air sample will be collected from the effluent of the SVE system. Air injection will continue at the primary injection rate and flow for approximately 24 hours. The actual durations will be dependent on the parameters observed during the test, and may increase or decrease to accommodate for unforeseen conditions.

The second step of Phase II will include air injection in all three pilot AS Wells, at an injection pressure and flow rate of a minimum of 6 cfm per well. Air sparging will continue at the secondary injection rate and flow for approximately 24 hours. System parameters will continue to be collected per Table 1 throughout this portion of the test, and a third sample of the extracted vapors will be collected near the end of this phase for laboratory analysis.

All of the data collected during the pilot testing will be compiled and analyzed for incorporation into the design of the full-scale IM system.

3.3 FULL SCALE DESIGN

The data collected during the pilot test will be evaluated to determine the design criteria for the full scale system. The design criteria to be determined are:

- AS well spacing,
- AS well depth,
- SVE well spacing,
- blower specifications,
- Air compressor specifications, and
- expected SVE emission concentrations and flow rates.

3.4 FULL SCALE IMPLEMENTATION

After the pilot test data has been evaluated and analyzed, a full scale IM system will be designed for implementation. An IM Implementation Workplan will

be submitted to EPA for review prior to installation. For the purposes of this document, this section provides a conceptual model of the full scale system.

The full scale IM will provide control over the migration of dissolved toluene by incorporating both traditional air sparging and biosparging technologies. Specifically, site activities conducted during the IM will focus on the elevation of dissolved oxygen levels between source areas of the toluene plume (area defined by wells historically containing separate-phase organics) and the Duwamish Waterway. While these interim activities are primarily designed to prevent the migration of dissolved toluene into the Waterway, the enhanced degradation is expected to be a key element to the full-scale site remedy.

The system will incorporate an AS/SVE system that will accelerate mass removal of toluene from the groundwater, saturated soils, unsaturated zone and potentially the LNAPL layer. The AS/SVE system will consist of two major components, an AS/SVE component, and a biosparging component.

The first component will consist of a series of AS Wells and SVE Wells located in close proximity to the source area of the toluene plume. The AS Wells will be located in a circular pattern around the toluene source plume, i.e., the area where separate phase organics (LNAPL) have been detected in the past. The SVE Wells will set up on a grid pattern overlaying the source area of the toluene plume. Figure 3 contains a conceptual view of the locations of the AS and SVE Wells for the IM.

The second component will consist of a series of biosparging wells located in a line perpendicular to the flow of groundwater, between the plume and the Waterway (Figure 3). These wells will provide a barrier through which impacted groundwater will pass before reaching the Waterway. The toluene concentrations in the groundwater passing through this barrier are expected to be at levels which will be effectively degraded by the biosparging system.

This arrangement will provide the necessary means for removing and degrading the toluene, while minimizing the potential for any impact to the Waterway. The exact locations, spacing, and construction details of all wells and associated equipment will be determined after the pilot test.

3.5 DATA ANALYSIS/ EVALUATION CRITERIA

Procedures for evaluation of the IM system will be based on the system configuration and operating conditions. The procedures, including groundwater monitoring, will be developed based on the results of the pilot test and will be presented in the IM Implementation Workplan.

3.6 DATA COLLECTION QUALITY ASSURANCE AND DATA MANAGEMENT

The Data Collection Quality Assurance and Data Management Plans for the RFI Workplan (Sections 6 and 8, CH2M Hill 1993), will be utilized during implementation of this Workplan. These plans were developed to meet the requirements defined in Attachment B of the Consent Order. Prior to transfer of any analytical data collected during implementation of this Workplan, EPA will be contacted to ensure that data are provided in the required format.

3.7 REPORTING

The IM Implementation Workplan will document all pilot test methods and data and will constitute the report for this effort.

4.0 SCHEDULE

The preliminary schedule for implementation of the IM tasks is presented in Figure 4. As required under paragraph 7.2 of the Consent Order, work shall commence within 30 days following EPA approval of the Workplan. A IM Implementation Workplan will be submitted to EPA following performance of the pilot test and completion of the IM System design.

G:\APROJECT\HODIA\IMWrkpin.doc

5.0 REFERENCES

CH2M Hill. 1993. Final RCRA Facility Investigation (RFI) Workplan for the Marginal Way Facility, Tukwila, Washington. December 1993.

CH2M Hill. 1995. RCRA Facility Investigation (RFI) Report for the Marginal Way Facility, Tukwila, Washington. June 1995.

G:\APROJECT\HODIA\IMWrkpin.doc

APPENDIX A EVALUATION OF INTRINSIC ASSIMILATIVE CAPACITY TO DEGRADE TOLUENE

EVALUATION OF INTRINSIC ASSIMILATIVE CAPACITY TO DEGRADE TOLUENE

Introduction To Intrinsic Remediation

The two primary microbiological processes involved in the intrinsic degradation of toluene are aerobic and anaerobic metabolism. Aerobic, intrinsic degradation requires that adequate oxygen be available for the metabolic processes to occur. However, since the kinetics of oxygen utilization are essentially instantaneous compared to the relatively slow movement of groundwater, oxygen usually cannot be continuously supplied and frequently becomes depleted in an area of hydrocarbon-impacted groundwater. Portions of the impacted area may then revert to anaerobic processes. Anaerobic metabolism is evidenced by use of alternative electron acceptors such as nitrate, iron, sulfate, and carbon dioxide if corresponding reducing conditions (i.e. redox potential) are suitable. Since anaerobic processes occur at kinetic rates slower than the kinetic rate of oxygen utilization, these alternate electron acceptors can usually be continuously resupplied by migrating groundwater. In many such cases, anaerobic processes are responsible for the major portion of biodegradation of petroleum compounds in groundwater.

Intrinsic Bioremediation Evaluation

An evaluation of intrinsic bioremediation potential was performed to determine the presence and relative contributions of both aerobic and anaerobic biodegradation in remediating toluene impacts, whether those processes could provide an explanation for the groundwater quality data at the downgradient property boundary, and whether the intrinsic process would be adequate to remediate the dissolved-phase impacted groundwater without further remedial efforts.

Evidence of biodegradation processes was evaluated by comparing biogeochemical data in impacted groundwater against less impacted, side-gradient groundwater. These data were then further utilized to quantify the assimilative capacity of the water-bearing unit to degrade dissolved-phase organic compounds, by comparing use of electron acceptors for both aerobic and anaerobic processes. The assimilative capacity is defined as the total mass of organics which the formation is capable of degrading, both aerobically and anaerobically.

pH and Alkalinity

The pH of groundwater has an effect on the presence and activity of microbial populations in groundwater (Wiedemeier, et al, 1995). An acceptable pH range for intrinsic microbial processes is generally recognized as pH 5.0 to 9.0. All sampled groundwater for the recent biogeochemical evaluation are within this acceptable range.

The total alkalinity of a groundwater system is indicative of the capacity of the system to neutralize acid (Wiedemeier, et al, 1995). This is important in maintaining the pH of the groundwater system within the acceptable pH range to maintain on-going microbial processes and buffer the groundwater against the accumulation of acidic byproducts produced during aerobic and anaerobic biodegradation. In general, hydrocarbon-impacted groundwater exhibits a higher total alkalinity than less impacted or non-impacted areas.

This observation is consistent with recent site data, where less impacted, side-gradient values of total alkalinity at MW-A09 of 191 mg/l as CaC0₃, whereas total alkalinity values at a higher impacted location MW-17 was measured as 1310.0 mg/l as CaC0₃. pH was measured at MW-A09 at 6.33 and at 7.37 at the more impacted location MW-17.

These results indicate an adequate buffering capacity in the Tukwila site groundwater for on-going microbial degradation of toluene.

Assimilative Capacity Calculations:

Table A-1 provides a summary of the natural groundwater system's estimated assimilative capacity based on "background" water quality compared to the geochemistry within the impacted groundwater zones. The table presents the major degradation pathways typical of dissolved aromatic hydrocarbons and lists the indicator parameters used to calculate the assimilative capacity through each mechanism.

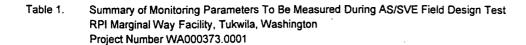
Conclusions

Based on biogeochemical data collected from the Tukwila site groundwater, the total calculated assimilative capacity of the predominantly anaerobic microbial processes is approximately 22 mg/l toluene. While this total assimilative capacity could be conservative, optimistic values for increased assimilative capacity still are not adequate when compared to dissolved phase concentrations of toluene detected in site groundwater. There is an inadequate supply of electron acceptors available in the groundwater to sufficiently assimilate the concentrations of toluene.

Recommendations

The site groundwater is adequately buffered and very suitable to support ongoing and enhanced rates of biodegradation. Biogeochemical data collected supports the presence of intrinsic processes involved in remediating dissolved phase toluene. These on-going intrinsic processes can be augmented with oxygen enhancement (air sparging) and mass removal of toluene in source areas.

TABLES



Parameter	Method	Minimum Frequency*
Water Level	Water Level Meter	30 minute intervals for first 2 hours of each Phase 1 hour intervals for next 4 hours
Dissolved Oxygen	Dissolved Oxygen Meter	30 minute intervals for first 2 hours of each step 1 hour intervals for next 4 hours
pH, Redox Potential, Temperature, and Conductivity	Multi-Probe Instrument	Beginning and end of each step
Vacuum/Pressure	Magnehelic Gauges	30 minute intervals for first 2 hours of each Phase 1 hour intervals for next 4 hours
Air Flow Rate	Anemometer, Pitot Tube	hour intervals for first step hour intervals for first and last 2 hours of step of Phase II
Hydrocarbon Concentration	FID Meter	1 hour intervals for first step 1 hour intervals for first and last 2 hours of step of Phase II
O2 and CO2 Concentration	Explosimeter and CO2 meter	hour intervals for first step hour intervals for first and last 2 hours of step of Phase II
Groundwater Sample	Toluene, iron, manganese, alkalinity, hardness, Biogeochemical parameters	Beginning and end of each step
Vapor Sample	Toluene, O2, CO2, CH4	End of Phase I (SVE only) and end of each step

•	On-site personnel will collect the maximum number of data points possible with the field equipment available.
	Oli-Site beisolitiei will collect the maximum number of data points possible with the neid equipment available.

CH4 Methane CO2 Carbon dioxide O2 Oxygen

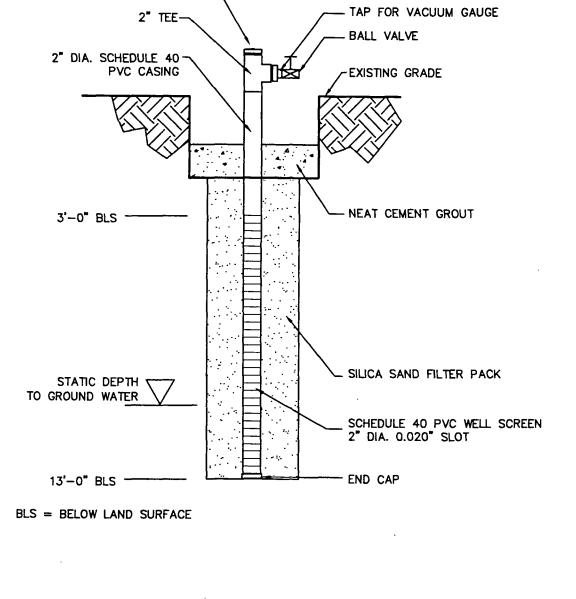
SVE/AS Soil vapor extraction/air sparging

TPH Total petroleum hydrocarbons

O

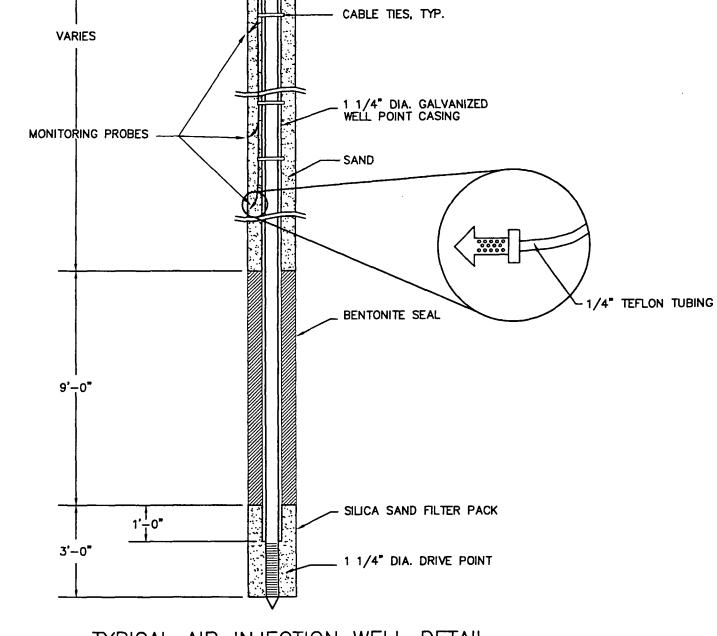
FIGURES

FILENAME: 11613A_8\11613_8B.DVG CREATED: DEC 09 1997 13:33:53 UPDATED: JAN 23 1998 13:33:41 PLOTTED: JAN 23 1998 13:58:57 (WS#31/N) @ DOWL 1997 SCALE IN FEET (OMJ9) Materway \$ Lg AIR SPARGING WELL S MILLER, INC. PLOT TEST
WELL LOCATIONS
RPI MARGINAL WAY FACILITY
TUKWILA, WA DRAWING NO.



EXPANSION CAP (WELL SEAL)

NOTES 1. AIR INJECTION WELL HEADS WILL BE COMPLETED WITH A BRASS CONTROL VALVE (HAND) AND A BRASS PETCOCK FOR PRESSURE MEASUREMENT (PLACED ON WELL SIDE OF CONTROL VALVE). EXISTING GRADE CABLE TIES, TYP. **VARIES** 1 1/4" DIA. GALVANIZED WELL POINT CASING MONITORING PROBES SAND



TYPICAL AIR INJECTION WELL DETAIL

NOT TO SCALE

GERAGHTY & MILLER, INC. **Environmental** Services A Heldernij Company

SVE WELL CONSTRUCTION DETAIL

NOT TO SCALE

DRAWING CONFIDENTIAL: THE DRAWING AND ALL REFORMING CONFIDED TREATED IS AND SHALL REMAIN THE PROPERTY OF GENERAL ACCURATE AND AND ADDRESS OF A SHALLER, BC. AS AN DETERMINET OF PROPERSION, THE REPORT OF PROPERSION, THE REPORT OF REPORT OF THE PALL HOST OF SECOND, THE PROPERSION WITTEN COMBENT OF SEPARATY & MILLER, BC.

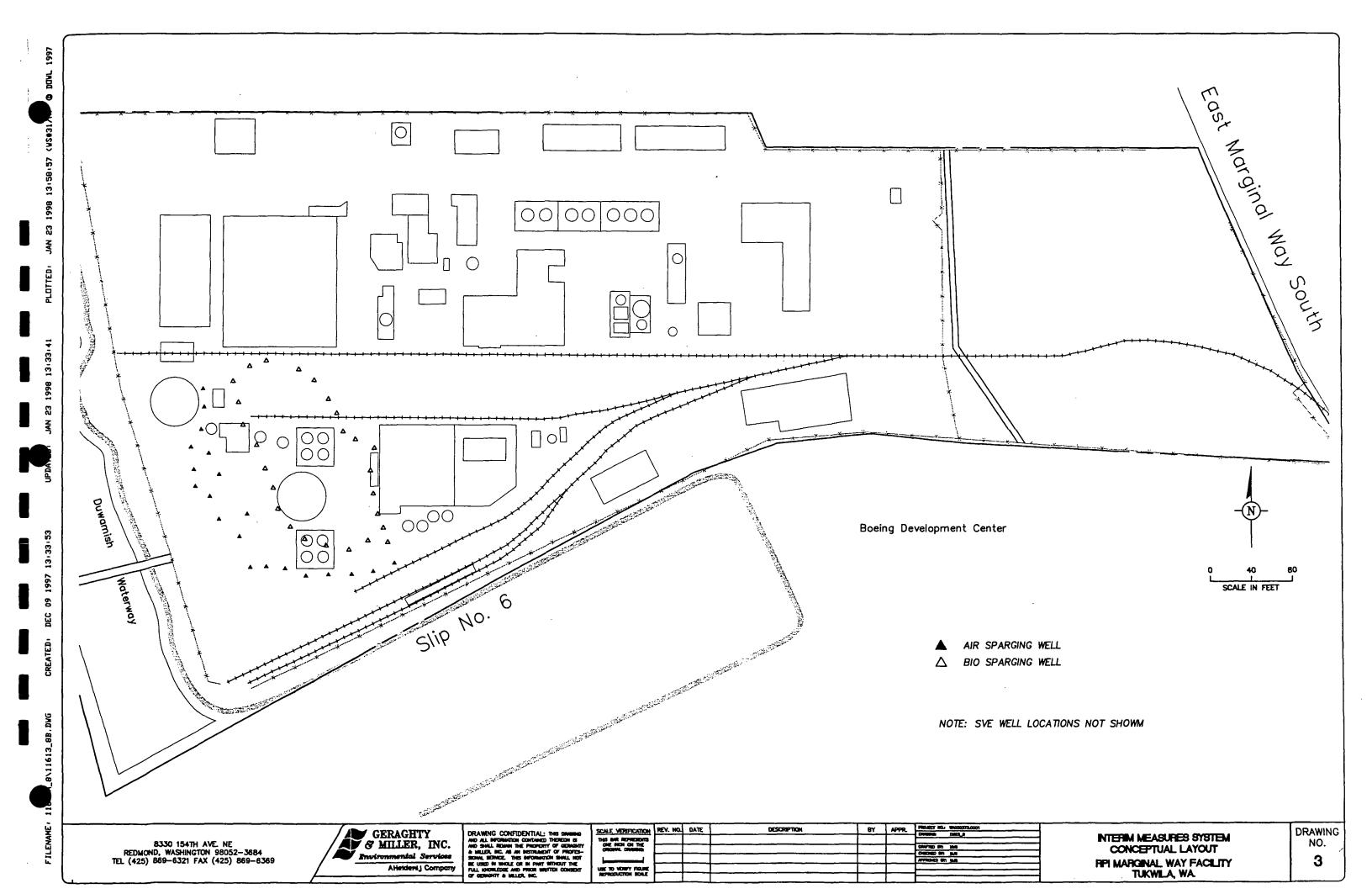
SCALE VERIFICATION REV. NO. DATE USE TO VEHILY FIGURE

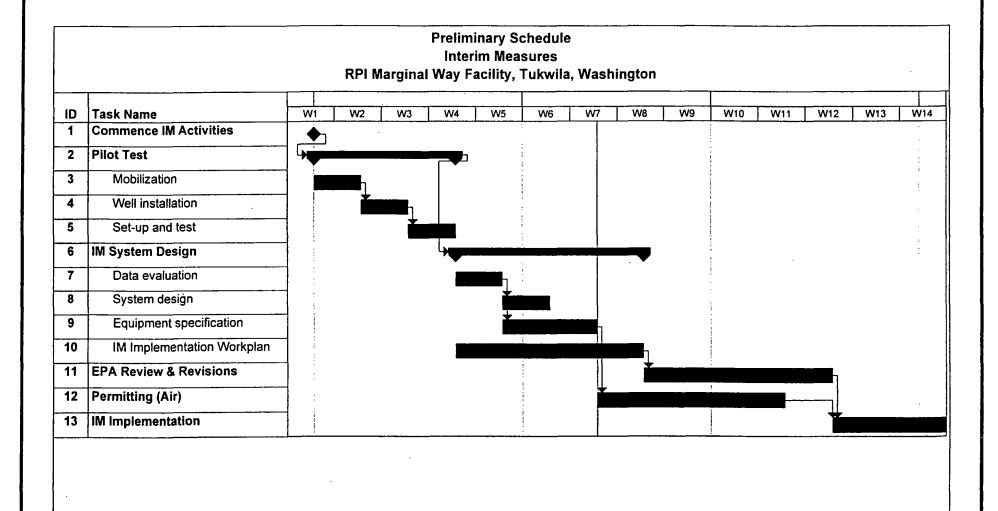
DESCRIPTION

WELL CONSTRUCTION DETAILS RPI MARGINAL WAY FACILITY TUKWILA, WA.

DRAWING NO.

2





19 9			
0			
ight			ARCADIS GERAGHTY&MILLER
چ			MICHUIS OLIMOITI I QIVILLEN
ုင္ငံ	NO. DATE REVISION DESC	RIPTION BY	



	DRAWN DRAWN	DATE DATE	PROJECT MANAGER PROJUNGR	DEPARTMENT MANAGER DEPTMANAGER
i	Preliminary S		LEAD DESIGN PROF. LEADDESIGN	CHECKED
	Interim Me: RPI Marginal W		PROJECT NUMBER	DRAWING NUMBER
_	Tukwila, Was		WA000373.0001	4
				1

TRIAD MACHINERY
TUKWILA, K.

WADO39267174 11210 PACIFIC HIWY. SO.





1-/2 2

Department of Ecology - NWRO Hazardous Waste and Toxics Reduction

SITE VISIT REPORT

RCRA ID: WAD039267174

GENERATOR TRAD MACHINERY Corp

ADDRESS: 11210 PACIFIC HWY S

CITY: TUKWILA

PURPOSE OF VISIT: To provide business assistance to 1993 delinquent

reporters for dangerous waste activity.

DATE OF VISIT: 4/18/96

STAFF: Leslie Morris, Intern; Barb Smith, Supervisor

COMMENTS: Peerless Corp. is delinquent for 1991 report,

that is why they are still in system even though Peerless notified to withdraw RCRA ID in 1994 with effective date 12/31/91. Peerless corporate office is located in Canada (B.C.)

Site now occupied by Triad.

FOLLOW-UP ?: No

Will obtain 1991 report form from HQ and mail to Peerless Corp with short letter. 5/1 Form 4 and short letter mailed to Peerless.

WASHINGTON STATE DEPARTMENT OF ECOLOGY

Send To:

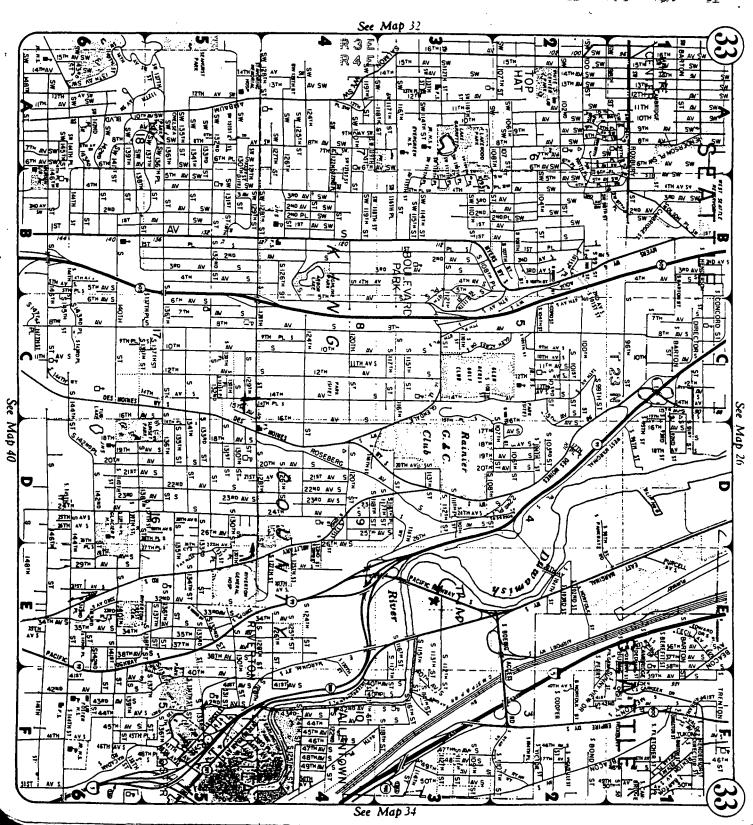
Send 10:
Washington Department of Ecology
Hazardous Waste Information & Planning
Attn: DW Notifications
P.O. Box 47658
Olympia, WA 98504-7658
(206) 459-6387

FORM 2

DEPARTMENTAL USE ONLY	
REC'D MAR 1 1 1994	7
LOG MAR 1 4 1994 REVIEW MAR 1 5 1994	
G/WAC	
WA	

					N)		GA	111	UN	lU		UF	IM	ű٤	H	JU	2 I	NA	121		Ą	ا ا ر	IVI		E9		_	_	. /
•	. ₹	∄ A.		IRS7 o previ						de for	this s	ite.)				X	В.	RE\	/ISE plete a	ED N	TOI	IFI(of the	CAT form. (ION Enter	existir	ATE		9 (in 1F.)	9	4
] C.		/ITH								te ID	<u> </u> # in 11	 F.)				REA								ete al	section	ons o f	the f	orm.
] E.	. C	ANC	EL	SIT	E) #	DATE	<u> </u>			_	•		X	_	Enter		-	_			_		20	12	<u> </u>	111	> 4
,				ite clos omplet										F.)		<u>ф</u>		(Comp												
Ì	2./			SHII VEN		_	_									2.B.		C CC		(S)	s	ECO	NDA	RY			ОТ	HER		
ŀ		6	0	1	_	3	8	1	_	0	5	8			<u> </u>	5	0	8	2			Π								
	2.0	C. T	YF	EO	F B	USI	INE	SS	COI	NDL	JCT	ED	AT	THI	S SI	ITE	HE	AVY	EQ	UIP	MEN	T S	ALE	S A	ND	SER	VIC	E		
	3.	NA	ME	OF	INS	STA	LL.	ATIC	N																					
	T	R	Ι	A	D		М	A	С	Н	I	N	E	R	Y															
	4.	LO	CA	TIO	ΝО	FIN	IST	ALL	ATI	ON	(At	tacl	n si	te lo	ocat	ion	ma	p.)	į											
/		reet		Т.		_	1_	Γ.	T :	1	Τ_	T	T :-	т—	Τ.		T .	1	1	Τ.	Γ	т —	Τ.	Γ.	1	т				
ŀ	1	1	2	$\frac{1}{1}$	0	-	P	A	С	I	F	Ι	С	<u> </u>	Н	I	G	H	W	A	Y	ŀ	S	0	U	T	Н	·		
ŀ	C		 tv 1	Vam	<u>_</u>	K	I	N	G	-			-	Ī	Ι -	Τ	T	П	Γ-	Γ-	Γ	Τ	Г	Π	Γ-	T	Ī			
ł				own		K	1	I N	<u> </u>	L	L	L	<u> </u>	<u>l</u>		<u> </u>	<u> </u>		St	Late	Z	IP C	Code	<u> </u>	L		<u> </u>	L		Ĺ <u></u>
ŀ	T	U	к	T	I	L	A	Γ						T	Γ	Π	Τ	Π	W	A	9	8	1	6	8	T_				
	5.	INS	STA	LL/	ATIC	N N	ΙΑI	LIN	G A	DDI	RES	S			L.,	1														
[St	reet	or	P.O	. B	οx		•																						
	1	1	2	1	0		P	A	С	I	F	I	С		Н	I	G	Н	W	A	Y		s	0	U	Т	Н			
	Ci	ty o	r T	own	1	T	1				γ		_	т			. .		St	ate	Z	IP C	ode	9		,			-	
l	T	U	K	W	Ι	L	A												W	A	9	8	1	6	8	_				
ŀ				TAL	LA	(OI	A C	ONI	AC									16												
}	C	l L	(Ia	M M	P	Τ		Τ	T	1	Τ	Τ-	Т	Τ	Т		Ι-	╅╌	irst)	-	T.,	٦,	Γ.		1	Τ	r—	$\overline{}$		Γ-
ł	.lo	b T	Ь.	ــــــــــــــــــــــــــــــــــــــ	Ρ.	<u></u>	<u> </u>	<u></u>		<u> </u>	<u> </u>	<u> </u>	<u></u>	L	<u> </u>	<u></u>	Ц.,	J	A Ph	M	E Ni	S	L		L	<u> </u>	<u>. </u>	<u> </u>		L
ŀ	s	Е	R	τ	I	С	E	Γ	м	A	N	A	G	E	R				2	0	6	_	7	6	2	Ι_	7	1	0	0
Ì				TAL	LA	101	_	ONT			_		_		_	S								,	_		,	_		
	St	reet	or	P.O	. B	ΟX																								
	1	1	2	1	0	<u> </u>	P	A	С	I	F	I	С		Н	I	G	н	W	A	Y		S	0	U	T	Н			
	Ci	ty o	r T	own											·	γ			St	ate	Z	IP C	ode	9	_					
	T.	U	K	W		L	A												W	A	9	8	1	6	8	_				
				ME.C		NS T		T^{T}	_		_	_	_	T	$\overline{}$,	 		- 3,745	jake d	1 - 2 -	1			\	W e			
ł	T	R	I	A P.O	D		М	A	С	Н	I	N	Е	R	Y	<u> </u>	<u></u>	<u>. </u>	<u> </u>	<u> </u>		L	<u> </u>			<u> </u>	<u>L</u>			<u> </u>
}	4	5	3	T ₀	, D.	N	E	Γ	1	4	8	Т	Н	<u> </u>	A	v	Е	T		<u> </u>		Γ_				<u> </u>	Ė.			_
1		ــــــــــــــــــــــــــــــــــــــ		own	I	1 11	1 12	L	1_1_	14	10	L <u>+</u> _	Lπ	L	I A	<u>.</u>	I E	L	St	late	Z	IP C	ode	L	L	<u> </u>	<u> </u>			
Ì	P	o	R	Т	L	A	N	D			Π			Γ		Γ		1	0	R	9	7	2	3	0	_				
	٦.	B. F	PRO	ĎРЕ	RT	/ O!	ΝŅΙ	ERS	HIF	? (A	lso	pro	vid	e ac	ldre	SS	n s	ecti			di	fere				۸.) ¥		THE REAL PROPERTY.		
	Р	E	E	R	L	Е	S	s		С	0	R	P																	
										7.C	. 01	NNI	ER 1	TYP	E	7.0). P	ROF	PER	TY	TYF	DE.								
												P							P											
L																Щ.														

8.A. N (S	AME OF INSTALLATION ame as Item No. 3)	TRIAL MACHINE	RY	8.	B. SITE ID#	
	YPES OF REGULATED D structions for this section of					
9.A. H	AZARDOUS WASTE ACT	IVITIES (See instru	ctions for definition	ons of these activitie	es).	
1	1. GENERATOR 🗆	1a. Conduct on-site	e recycling 🧳	2		
	2. TRANSPORTER	2a. Transport Wa 2b. Modes of Trans		• •	• • –	iter (5) *Other Specify in comments)
	3. MANAGEMENT FAC	3b. Pr (1 (4 3c. Cr	rocess conducted	or available at this 2) ☐ Storage (3) y in comments).	facility;	
	4. IMMEDIATE RECYCI		an D 1 100033	103 110		
	5. PERMIT-BY-RULE FA	ACILITY				
	6. MARKET OR BURN I			Generator Marketii	_	
9.C. D <i>i</i>	SED-OIL FUEL ACTIVITIE 1. OFF-SPECIFICATION USE 2. SPECIFICATION USED-OI ANGEROUS WASTE OR ee instructions for definitions	D-OIL FUELS—1a. CO L FUEL MARKETER (or OFF-SPECIFICATIO of combustion devices	ON-SITE BURNER) ON USED-OIL FL s) 1. Utility Boile	WHO FIRST CLAIMS JEL BURNING: TYI er 2. □ Industrial Bo	THE OIL MEETS THI PE OF COMBUS	E SPECIFICATION. TION DEVICE.
10. W	ASTE IDENTIFICATION (Copy this page if yo	u have more thar	5 waste streams)		
NU NB ER	A. DESCRI	PTION OF WASTE(S)		B. DANGEROUS WASTE NUMBER(S	C. ESTIMAT OR ACTUAL A WASTE QUA	ANNUAL GD
1	SOLVENT			D 0 0 1 D 0 1 D 0 3 9		1 0 0 0 P
2	PAINT THINNERS			F 0 0 3 F 0 0 D 0 0 1 W T 0	5 2	4 0 0 P
3	ANTI FREEZE			W 0 0 2 W T 0	$\begin{vmatrix} 2 \\ \end{vmatrix}$	7 0 0 P
4	MOTOR OIL			W P 0 2 D 0 0 W T 0 2		6 0 0 0 P
5				+++++		
11.A.	(Batch Frequenty 3 March Country Weight Coope	MONTH) 11.B. [PER MONTH OUANTITY 6 7	WEIGHT 5 P CODE OUAN		TIME ONLY MATITY WEIGHT CODE
12.	COMMENTS	former 14	feerles.	e Corp 1	1210 Paciti	C Hay S
	B. PEERLESS CORP			eattle	2	77.04 3,
TU	JKWILA, WA 98168	· · · · · · · · · · · · · · · · · · ·	h Plat mil.	iners: TRi	ad mach	£ 10, a1-14
			new ou	1121		
					akwila	
			,	~		
13.	CERTIFICATION			(change	handler list	ukwila)
attad infor	rtify under penalty of law the ched documents, and tha rmation, I believe that the s alties for submitting false in	t based on my inqui ubmitted information	uiry of those ind is true, accurate,	familiar with the info ividuals immediatel and complete. I an	ormation submitte by responsible for a aware that there	d in this and all obtaining the
IGNA	ames V Clary		NAME AND OFFICIAL JAMES V. CLA SERVICE MANA	ALTITLE (type or print) MP GER	DATE SIGNE	î4-
-/1-	5/92) BACK Frame		A CORY FOR YOU			



E-POULENC OULENC, INC.
WADO09282302

, K.
HEW 5::1
GERTIFICATION OF
GERTIFICATION OF
STATUS, January 1992

CLOSURE AND POST-CLOSURE REQUIREMENTS

40 CFR 265, SUBPART G WAC 173-303-400

RHONE-POULENC, INC.
Seattle Plant

August 1986 Amended August 1988 and July 1989

CLOSURE AND POST-CLOSURE REQUIREMENTS

40 CFR 265, SUBPART G WAC 173-303-400

RHONE-POULENC, INC.
Seattle Plant

August 1986 Amended August 1988 and July 1989

CONTENTS

		Page
1	Introduction	1
2	Closure Performance Standard	3
3	Closure Plan	4
	3.1 Partial and Final Closure Activities	4
	3.2 Maximum Waste Inventory	6
·	3.3 Inventory Removal, Disposal, or Decontamination of Equipment	8
	3.4 Closure of Drum Storage Area and Tank	10
	3.5 Drum Storage Area and Tank Closure Certification Procedures	14
	3.6 Closure of Other Units	15
	3.7 Schedule for Closure	15
4	Postclosure Plan	16
5	Notice in Deed	16
6	Closure Cost Estimate	16
7	Financial Assurance Mechanisms for Closure	16 .
8	Postclosure Cost Estimate	16
9	Financial Assurance Mechanism for Postclosure Care	19
10	Liability Requirements	19

APPENDIXES

Α.	Waste	Analysis	and	Designation
----	-------	----------	-----	-------------

- Vanillin Still Bottoms Information В.
- MSDSs for Decontamination Solution C.
- D. Financial Assurance Information
- Liability Information Field Sampling Plan E.
- F.

TABLES

		Page
1	Equipment and Structures Potentially Requiring Decontamination During Closure Operations	7
2	Maximum Inventory of Regulated Wastes	7
3	Decontamination Solutions That May Be Used During Closure	9
4	RCRA and WDOE Hazardous Wastes Possibly in Storage at the Time of Closure	11
5	Closure Observations of Drum Storage Area and Tank	1 5
6	Cost Estimate for Closure	17
FIGU	RES	
1	Site Plan	2
2	Permitted Storage Facility	5

CLOSURE AND POSTCLOSURE REQUIREMENTS

1. INTRODUCTION

This closure plan describes the activities that will be undertaken for the closure of the RCRA interim status storage area at the Rhone-Poulenc, Inc., plant in Seattle, Washington. The Seattle plant is an existing vanillin production facility. Vanillin is a vanilla substitute used in a wide variety of foods. During manufacture of vanillin, some RCRA- and WDOE-regulated wastes are generated. The fenced plant is located on the east bank of the Duwamish River, north of Slip No. 6 and west of King County International Airport. Figure 1 shows a site plan of the facility. General facility information is provided below.

USEPA/Washington

Identification No.: WAD009282302

Owner's Name: Rhone-Poulenc, Inc.

Address: CN5266

Princeton, New Jersey 08543-5266

Person Responsible for Maintenance of Closure Plan:

Closure Plan: Governmental Affairs Supt.

Plant Name: Rhone-Poulenc, Inc.

Plant Location: 9229 East Marginal Way South Seattle, Washington 98108

Copies of this closure plan and subsequent authorized amendments will be available at the Seattle plant. The Governmental Affairs Superintendent or his/her designee will be responsible for updating this plan as deemed necessary. It will be kept at the plant until closure is completed and certified.

The WDOE will be notified at least 45 days prior to the day closure is expected to begin.

Closure activities will be observed by an independent hazardous waste specialist under the supervision of an independent registered professional engineer. Based on the knowledge gained from these observations, the engineer will certify a professional opinion on whether the closure was accomplished in accordance with the approved closure plan as described herein. Rhone-Poulenc personnel will submit the 2

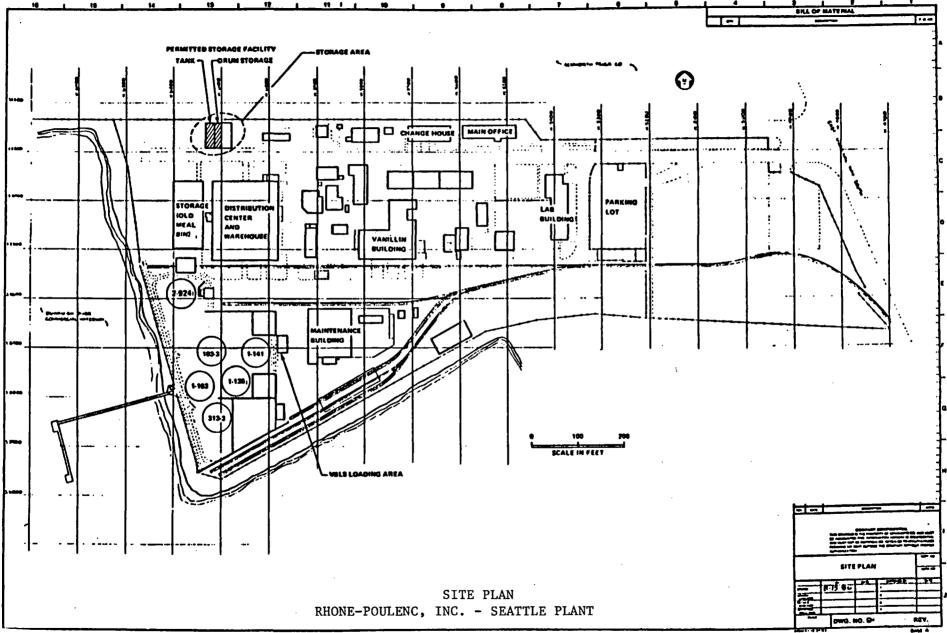


Figure 1

engineer's closure certification report along with Rhone-Poulenc's certification of closure to WDOE within 60 days of completion of closure (40 CFR 265.115).

2. CLOSURE PERFORMANCE STANDARD 40 CFR 265.111

Closure of the storage area as described in the following sections is designed to:

- o Minimize the need for further maintenance.
- o Control, minimize, or eliminate, to the extent necessary to protect human health and the environment, the postclosure escape of waste, hazardous waste constituents, leachate, contaminated runoff, or hazardous waste decomposition products to the surface or groundwater or to the atmosphere.

In general, these goals will be accomplished by removing regulated wastes from the storage area and decontaminating all bases, structures, or other materials containing or contaminated with regulated wastes or waste residue from the storage area. Extensive soil removal in conjunction with closure activities is not anticipated; the storage area has been paved, bermed, and equipped with a spill containment/ collection system since 1980, and there is no evidence that any regulated wastes were stored in this location prior to This information was obtained by talking with longtime plant employees and retirees. Only if leakage to the underlying soil through the concrete pad is suspected, based on visual inspection of the pad for cracks and concrete sampling, will soil sampling beneath the structure be considered. Samples of soil along the perimeter of the structure will be analyzed to determine the need for soil removal in these locations. Samples of soil in the vicinity of the abandoned sump will be analyzed to determine the need for soil removal in that location. Postclosure monitoring is not anticipated for these management units since regulated wastes or waste residues are to be removed. After closure of all the management units has been completed, the Rhone-Poulenc facility will no longer be classified as a hazardous waste storage facility. This area will be used in the future for storage of regulated wastes for less than 90 days in accordance with generator requirements (WAC 173-303-170 through 230).

3. CLOSURE PLAN 40 CFR 265.112

3.1 PARTIAL AND FINAL CLOSURE ACTIVITIES 40 CFR 265.112(b)(1)

The enactment of this plan will occur in 1989. Closure of the storage area and tank is expected to be completed within 180 days of receipt of the final volume of waste into the storage area.

The storage area is comprised of the drum storage area, which has interim status to store two drums of various waste solvents, and the waste tank, which is used to hold up to 4,500 gallons of strainer solids. (See Appendix A for waste analysis testing results.) The predominant waste stored in the storage area is, and in the past has been, bulk strainer This material is not a hazardous waste based on RCRA hazardous waste characteristics but is classed as a Washington dangerous waste based on the aquatic toxicity Although no drums have been stored in the storcriterion. age area since 1986, prior to that time drums of methylene chloride, waste shop solvents, and used oil were stored there. These drums were all in good condition and did not This latter is evidenced by the fact that the company used for disposal of drummed waste will not transport any leaking drums.

Immediately adjacent to and just east of the drum storage area is an area used to store a product, Vanillin Still Bottoms (VSB) (see Appendix B for discussion and MSDS). The tank, the drum storage area, and the VSB storage area are located on a common reinforced 1-foot-thick concrete pad and are separated from each other by cast-in-place concrete walls and from the surrounding soil by cast-in-place concrete walls on three sides. The fourth side is open and allows runoff from the sloped storage area to drain to a sump. Liquid from this sump is recycled back into the manufacturing process. Figure 2 shows the storage area. There is a roof over the storage area.

Closure activities will consist of:

- 1. Rhone-Poulenc will no longer accept wastes for longterm storage (i.e., greater than 90 days) in the storage area (consisting of the tank and the drum storage area).
- 2. Rhone-Poulenc will remove the stored regulated waste from the container storage area and tank and ship this material to an approved offsite TSD facility. Rhone-Poulenc will then decontaminate the equipment and structures of the storage area and tank as the final

5

Figure 2

closure activity. It is intended that only the tank and drum storage areas will be decontaminated, since the adjoining product storage area has been used only for storage of nonhazardous Vanillin Still Bottoms.

3. Rhone-Poulenc will complete the closure activities for the storage area and tank in accordance with this closure plan within 180 days after receiving the final volume of wastes (WAC 173-303-400 and 40 CFR 265.113(b)).

After completion of closure of the drum storage and tank areas via decontamination operations, this area will be used in the future for storage of containerized regulated wastes for less than 90 days in accordance with generator requirements only (WAC 173-303-170 through 230).

The anticipated equipment and structures at the plant that were used to handle regulated waste within the management units are shown in Table 1. Other equipment may be used during closure, but the same decontamination procedures will be undertaken as presented in this section. Decontamination will occur only on equipment, structures, and supplies that are in direct contact with the regulated wastes or waste residues and that would not otherwise be intended to be disposed of at an offsite TSD facility. During closure, the equipment and supplies may be either disposed of at an approved offsite TSD facility or decontaminated and either reused or disposed of offsite at a facility for disposal of nonregulated wastes. The closure of the storage area and decontamination of the equipment and/or structures are described in the following subsections.

3.2 MAXIMUM WASTE INVENTORY 40 CFR 265.112(b) (3)

The estimated maximum inventory of regulated wastes that could be in storage at any time during the life of the storage area facility is shown in Table 2.

Incompatible wastes are not managed at the drum storage facility. The estimates do not include accumulations of waste that may be caused by unusual contingencies.

Table 1 EQUIPMENT AND STRUCTURES POTENTIALLY REQUIRING DECONTAMINATION DURING CLOSURE OPERATIONS

Management Unit

,

Drum Storage Area and Tank (including base, walls, and spill containment system)

Equipment and Structures a

Water Containment System Forklift Washing Equipment Concrete Pad Concrete Tank Concrete Walls Safety Equipment Decontamination Equipment (e.g., buckets, brushes) Hoses Steam Cleaning Equipment Sampling Equipment Truck Equipment Tools Front End Loader Personnel Protective

Equipment

Table 2 MAXIMUM INVENTORY OF REGULATED WASTES

Storage UnitMaximum InventoryaTank4,500 gallonsDrum Storage Area100 gallons

a Decontamination will occur when direct contact with regulated wastes or waste residues has taken place.

^aWaste inventory is based on quantities authorized under interim status.

3.3 INVENTORY REMOVAL, DISPOSAL, OR DECONTAMINATION OF EQUIPMENT

40 CFR 265.112(b)(4), 265.114

General Closure Decontamination and Removal Procedures

The following provides a discussion specific to decontamination and removal procedures that may be used during closure of the storage area.

Upon closure of each management unit, equipment, supplies, structures, or other bulk solid wastes contaminated with regulated wastes or waste residue will be either transported to an approved offsite TSD facility or decontaminated.

Equipment and Structure Decontamination Solutions

During decontamination of equipment, supplies, and structures in each management unit, an appropriate decontamination solution will be used which has the capability of removing expected contaminants.

The hazardous constituents present in wastes that have been stored in the tank and the drum container storage area fall into one of two general categories: organic compounds (solvents and oils) and inorganic compounds (metals, sodium, and calcium carbonate salts). The solutions that may be used to decontaminate structures and equipment in these units are presented in Table 3 along with rationale for their selection. Decontamination efforts will be focused on the equipment and structures (Table 1) that have been used periodically for waste transport and handling, on the equipment used in the closure process, and the interim status structures themselves.

For equipment, it is anticipated that water application using a high-pressure hose or steam cleaning will be sufficient for decontamination. If it is found that steam cleaning or high-pressure water application is not sufficient for residue removal (based on visual observation of residue remaining and concrete sampling results), other decontamination options, including the use of detergents, are presented in Table 3.

Table 3
DECONTAMINATION SOLUTIONS THAT MAY BE USED DURING CLOSURE

Management Unit	Decontamination Solution Options	Rationale for Selection of Solution
Container storage area; tank storage area (in- cludes equipment and tools used during closure activities, structures, bases, and other surfaces)	Water	With the use of a high- pressure hose or a steam cleaning technique, surface contaminants can be physically extracted from equipment surfaces.
	Trisodium phos- phate (TSP) solu- tion wash (1 pound of TSP per 10 gallons of water)	TSP is considered a common equipment cleaning solution. This solution is used as a standard decontamination solution for Superfund sites.
	Heavy-duty clean- ing solution	See discussion on following page.

^aSelection of option will be made based on level of contamination expected at time of decontamination.

Although not anticipated during closure activities, in instances where high concentrations of contaminants of an organic and metallic nature are found based on concrete sampling, a heavy-duty cleaning solution such as that formulated by Formula Corporation of Des Moines, Washington, may be used for equipment or structure decontamination. The heavy-duty decontamination solution consists of the following:

Tetrasodium ethylenediamine tetraacetate
Sodium tripolyphosphate
Makon 6 (NP6)
Vanwet 9N9 (NP9)
Ethylene glycol monobutyl ether
Phosphate ester
Water

1.2 percent
5.0 percent
5.0 percent
2.0 percent
Balance

bSource: Guide for Decontaminating Buildings, Structures, and Equipment at Superfund Sites by PEI Associates, Inc., Cincinnati, Ohio. Prepared for U.S. Environmental Protection Agency. March 1985.

Each of the constituents in the formulation has a specific function: tetrasodium ethylenediamine tetraacetate is a chelant that dissolves transition metal compounds including those of lead, nickel, copper, and mercury, making them susceptible to removal from contaminated equipment. tripolyphosphate help prevent precipitation of hardness (calcium and magnesium) from the alkaline solution and buffer the solution in the alkaline region. The next four constituents act as surfactants and organic "coupling" agents to emulsify and stabilize solvents, oils, and other organ-NP6 and NP9 are nonionic surfactants. Phosphate ester is an anionic surfactant. An MSDS for each constituent is included in Appendix C. The decontamination solution may be diluted with water in the ratio of 1:10-1:25. The diluted cleaner can be used at ambient temperature and may be applied from a pressure sprayer.

Decontamination of equipment and structures in the management unit will generally follow the procedures below.

- 1. Rhone-Poulenc will decontaminate equipment and structures manually, using water or steam or a mechanical method (not anticipated). In some instances a heavyduty cleaning solution as previously described may be necessary to enhance decontamination.
- Samples will be taken of the concrete pad to determine whether additional steam cleaning is necessary. Samples will also be taken of soil adjacent to the concrete pad and in the vicinity of the abandoned sump to determine whether soil removal is necessary. Sampling procedures and decontamination criteria are presented in the next subsection.

3.4 CLOSURE OF DRUM STORAGE AREA AND TANK

40 CFR 265.197

Containers are stored in a concrete, curbed area (Figure 2). A concrete tank shares a wall with the drum storage area. The wastes potentially in storage at the time of closure are listed in Table 4. Within 90 days after receiving the final volume of regulated waste at the drum storage area, the drums will be inspected and repacked, if necessary, and shipped to an approved TSD facility. The strainer solids may be placed in a lined, covered dump truck or packaged in containers for shipment to an offsite TSD facility within 90 days. Waste generated from plant operations during the closure implementation will be handled as follows:

Drums - The only drummed waste generated on a regular basis is methylene chloride. This will continue to be accumulated in a 55-gallon drum near the laboratory where it is generated,

and this area will be managed as a satellite accumulation area according to WAC 173-303-200(2)(c). If any other drummed wastes are generated, these will be stored in areas where any leakage will be to drains leading back to the manufacturing process.

Strainer Solids - These solids will be accumulated in a plastic-lined, covered bin (roll-off box) located in an area where all drains are piped to the manufacturing process.

Table 4

RCRA AND WDOE HAZARDOUS WASTES

POSSIBLY IN STORAGE AT THE TIME OF CLOSURE

Waste	EPA/WDOE Waste Code	WDOE Designation	May Be Managed at Storage Facility
Strainer Solids	WT01	EHW	Yes
Used Peneteck Oil Residue	WT01	EWH	Yes
Waste Solves (Kingsolv)	WT01	EHW	Yes
Methylene Chloride	F002	EHW	Yes
Potential Hazardous Wastes Resulting From Emergency Conditions	Case-by- case de- termination	Case-by case de- termination	Yes

All containers will be labeled and handled in accordance with WAC 173-303-200. Except for the satellite area, all containers will be marked with the beginning accumulation date and will be shipped to an offsite TSD facility within 90 days of the date of first generation.

Remaining will be the concrete pad that has been used as containment for the drums during the active life of the facility. Also remaining will be the open concrete tank and the catch basin, piping, berming, and containment wall components to the concrete pad used for collection of accumulated liquids. The reinforced concrete pad that serves as the base for the storage area and tank is approximately 1-foot thick. A concrete and graveled soil surface is on the outside perimeter of the pad and the tank.

Once the wastes have been removed, it will then be possible to perform decontamination procedures on the concrete pad, concrete tank, and associated structures.

Steam cleaning has been shown to be capable of physically extracting contaminants from building material and equipment surfaces. The steam may be applied using portable steam cleaning equipment with hand-held wands or automated systems. The steam condensate will be collected in the containment sump system.

Prior to application of steam on the concrete pad and tank, plastic sheeting and other moisture barriers may be placed at the outside perimeter of the pad and tank to protect the surrounding surfaces. Containment barriers may be installed if necessary to allow for collection of the steam conden-Water from cleaning operations is expected to drain into the existing containment trenches and travel to the sump. The decontamination solution (see Table 3) to be used, if cleaning other than steam cleaning is necessary, will be determined by Rhone-Poulenc at the time of decon-If a detergent or heavy-duty cleaning solution tamination. is used that may make the decontamination solution unsuitable for process reuse due to the properties of these agents, the rinsate collected in the sump may be pumped into 55-gallon drums or a tanker truck for offsite disposal at a TSD facility. Otherwise, the sump contents will be reused in the manufacturing process (normal practice).

After the drum storage area and waste tank have been steam cleaned, they will be visually inspected for residue remaining on the concrete. Based on this visual observation, the steam cleaning operator and Rhone-Poulenc personnel will determine whether any additional steam cleaning should be performed prior to sampling the concrete.

After the steam cleaning operator and Rhone-Poulenc personnel have determined that sufficient steam cleaning has been performed based on visual observation, samples will be taken of the concrete pad to determine if copper or methylene chloride exceed cleanup criteria. General sampling procedures are discussed below. Detailed sampling procedures are presented in the Field Sampling Plan in Appendix F.

After steam cleaning, the waste tank concrete pad will be visually inspected for cracks. Three separate concrete samples will be taken from three separate cracks that are considered to be representative of the cracks in the concrete pad. The specific sampling locations will be determined in the field at the time of sampling. The concrete samples

aGuide for Decontaminating Buildings, Structures, and Equipment at Superfund Sites by PEI Associates, Inc., Cincinnati, Ohio. Prepared for U.S. Environmental Protection Agency. March 1985.

will be analyzed for copper. Copper may be naturally occurring in cement in concentrations of approximately 200 mg/kg (based on personal conversation with a local concrete plant). The concentration of copper naturally occurring in the concrete at Rhone-Poulenc is unknown. Because copper may be naturally occurring in cement, the copper concentrations in the concrete from the three cracks will be compared to copper concentrations found in background concrete samples taken from the outside surface of the waste tank wall. the copper concentrations in the concrete from the three cracks exceeds the average background concentration plus four standard deviations, then additional sampling at a greater depth in the concrete pad will be performed. These additional samples will be compared to the background samples in the same manner as described above. Additional information pertaining to sampling the waste tank concrete pad is presented in the Field Sampling Plan in Appendix F.

After steam cleaning, the drum storage area concrete pad will be visually inspected for cracks. One concrete sample will be taken from a crack that is considered to be representative of the cracks in the concrete pad. The specific sampling location will be determined in the field at the time of sampling. The concrete sample will be analyzed for methylene chloride. A previous spill of methylene chloride is not suspected because the methylene chloride was contained in DOT-approved steel drums and no leakage has been observed. If any minor leakage did occur, the methylene chloride should have evaporated because it is highly vola-An action level of 500 ug/kg (ppb) will be used to determine if further action is necessary. This concentration is used as the action level because the U.S. EPA health advisory level for methylene chloride at 10 cancer risk is 500 ug/l (ppb) (Drinking Water Regulations and Health Advisories, U.S. EPA, December, 1988). If the concrete sample exceeds 500 ug/kg of methylene chloride, additional sampling at a greater depth in the concrete pad will be performed. The additional sample will be compared to the action level of 500 ug/kg to determine if additional sampling is necessary. Additional information pertaining to sampling the drum storage area concrete pad is presented in the Field Sampling Pad in Appendix F.

After the bases and sides of the concrete slab and concrete tank are steam cleaned and water drained from the sump, the steam cleaner wand will direct water flow directly into the catch basin for at least 5 minutes under constant flow. This will provide for the removal of residual contaminants from the collection pipeline and sump. The decontamination water will again be picked up with the existing sump pump and recycled back into the manufacturing process. The sump will then be leak tested by filling the sump with water to the high water level mark (the water level at which the sump

pump starts pumping). The sump pump will be manually turned off for the duration of the leak test. The water level will be measured initially with a tape measure extended from the top of the sump, and it will be measured again (twice within the first 12 hours and at the end of 24 hours) to determine if the water level has gone down.

Soil samples will be taken to the west and north of the strainer solids waste tank and immediately adjacent to it and analyzed for copper. Copper is a naturally occurring element in soil. Therefore, the copper concentrations in soil adjacent to the waste tank will be compared to copper concentrations found in onsite background soil samples. If the copper concentration in soil adjacent to the waste tank exceeds the average background concentration plus four standard deviations, then additional sampling and soil removal may be necessary. Additional information pertaining to soil sampling is presented in the Field Sampling Plan in Appendix F.

Soil samples will be collected in the vicinity of the abandoned sump. The abandoned sump is located east of the existing sump and south of the drum storage area. The exact location of the abandoned sump will be determined from previous plant drawings prior to sampling. It will be necessary to cut through the concrete pad to collect the soil samples. The soil samples will be compared to background soil samples in the same manner as described above.

3.5 CONTAINER STORAGE AREA AND TANK CLOSURE CERTIFICATION PROCEDURES

40 CFR 265.115

Closure activities will be observed by an independent hazardous waste specialist under the supervision of an independent registered professional engineer. It is anticipated
that the total closure observation effort by the independent
hazardous waste specialist, as outlined in Table 5, will
range from 2 to 4 days. Based on the knowledge gained from
these observations and other closure documentation (i.e.,
analytical results, field logbook, manifests) the engineer
will certify a professional opinion on whether the closure
was accomplished in accordance with the approved closure
plan as described herein. Rhone-Poulenc personnel will submit the engineer's closure certification report along with
Rhone-Poulenc's certification of closure to WDOE within
60 days of completion of final closure.

Table 5 CLOSURE OBSERVATIONS OF DRUM STORAGE AREA AND TANK

Initiation of Closure Process Observation

o First day of closure field activities

Intermediate Observation

o First day of steam cleaning operation on concrete slab

Final Observation

o At completion of closure process

3.6 CLOSURE OF OTHER UNITS

Closure of Surface Impoundments 40 CFR 265.228

The facility does not have surface impoundments for regulated waste.

Closure of Incinerators 40 CFR 265.351

The facility does not have incinerators for regulated waste.

Closure of Land Treatment Facilities 40 CFR 265.280

The facility does not have land treatment facilities for regulated waste.

Closure of Disposal Units and Waste Piles 40 CFR 265.310.250

The facility does not have disposal units or waste piles for regulated waste.

3.7 SCHEDULE FOR CLOSURE

40 CFR 265.112(a) (4)

The facility will be closed in 1989. Within 180 days of receiving the final volume of waste at the storage area, closure activities will be completed. Actual closure of the interim status facilities is anticipated to take less than 30 days. Upon closure of the storage area, Rhone-Poulenc will no longer be a storage facility for regulated wastes. Rhone-Poulenc will at that time be only a generator of regulated waste.

4. POSTCLOSURE PLAN 40 CFR 265.228(b), 265.280(c), 265.310(b)

It is intended that no regulated wastes will be left in place after closure, thus obviating the need for a post-closure plan. Development of a postclosure plan will be contingent upon the need for it.

5. NOTICE IN DEED 40 CFR 26.5.120, 265.117(c), 265.119

No regulated wastes will be left in place after closure; therefore, a notice in the deed regarding regulated waste will not be necessary.

6. CLOSURE COST ESTIMATE 40 CFR 265.142

Table 6 shows the cost of closure as described in the closure plan. Total closure costs are estimated to be approximately \$23,500. The estimate is based on the assumptions provided in the table to reflect the expected activities to be conducted during unit closure. The following represents the assumptions used in obtaining a cost estimate.

- o The cost for the maximum number of drums for removal from the drum container storage area is assumed to be the disposal of that waste with the most expensive transport and disposal cost.
- o Costs are based on a third party conducting the closure operations.

7. FINANCIAL ASSURANCE MECHANISM FOR CLOSURE 40 CFR 265.143

A financial test and corporate guarantee for closure has been provided by Rhone-Poulenc under separate cover and copies have been included in this plan as Appendix D.

8. POSTCLOSURE COST ESTIMATE 40 CFR 265.144 WAC 173-303-620 (5)

It is intended that no regulated wastes will be left in place after closure, obviating the need for a postclosure cost estimate. This estimate will be developed, however, contingent upon its need.

		Description	Unit	Unit Man-hours	Labor Rate/Hr	Equipment Hours	Equipment Rate/Hr	Subcontractor Unit Price	Unit Cost	No. <u>Units</u>	Total ^b Cost	Resources/Comments
	1.	Load Tank Waste	СҰ	0.154	30.66	0.0513	76.67		8.66	23	199.18	Current projects
	2.	Transport Tank Waste to TSD	LD					1,045.00	1,045.00	2	2,090.00	950/load plus 10 percent contractor OH&P
	3.	Dispose of Tank Waste	TN					165.00	165.00	23	3,795.00	150/ton plus 10 percent contractor OH&P
	4.	Load Drums	HR	1.00	28.12	0.50	67.4		61.82	1	61.82	
17	5.	Transport Drums	LD					1,045.00	1,045.00	1	1,045.00	950/load plus 10 percent contractor OH&P
	6.	Dispose of Drums	EA					72.60	72.60	2	145.20	66/each plus 10 percent contractor OH&P
	7.	Steam Clean Storage	EA	8	28.12	4	53.57		439.24	, 1	439.24	Allowance based on 2 crew hours
	8.	Sample Washwater	EA						488.50	2	977.00	Past projects
	9.	Analyze Washwater	EA						1,300.00	2	2,600.00	Past projects
	10.	Transport Washwater to TSD ^a	GAL						0.22	2,000	440.00	0.20/gallon plus 10 per- cent contractor OH&P
	11.	Disposal of Wash- water at TSD ^a	GAL						0.83	2,000	1,660.00	0.75/gallon plus 10 per- cent contractor OH&P
	12.	Soil and Water Sampling	LD					4,000.00	4,000.00	1	4,000.00	Past projects, 30 total samples
	13.	Analyze Samples	ĽD					1,200.00	1,200.00	1	1,200.00	30 total samples
		Subtotal									18,652.44	

Table 6 (continued)

Description	Unit	Unit Man-hours	Labor Rate/Hr	Equipment Hours	Equipment Rate/Hr	Subcontractor Unit Price	Unit Cost	No. <u>Units</u>	Total ^b Cost	Resources/Comments
Health and Safety	LS						100	1	100.00	
Subtotal									18,752.44	
Mobilization, Bonds, Insurance	*							5	937.62	
Engineering Inspection	*							10	1,875.24	
Contingency	*							10	1,875.24	
TOTAL ESTIMATED CAPITAL C	OST	•							\$23,500.00	

This item will occur only if decontamination solution cannot be reused in the Vanillin process.

Units: EA = each, CY = cubic yards, LD = load, TN = ton, HR = hour, LS = lump sum, GAL = gallon.

b
The cost of some items that were estimated in 1986 may be slightly higher due to inflation. The inflation rate from 1986 to 1988 was previously estimated to be approximately 5 percent based on U.S. Department of Commerce inflation factors.

9. FINANCIAL ASSURANCE MECHANISM FOR POSTCLOSURE CARE 40 CFR 265.145

No regulated wastes will be left in place after closure; therefore, a postclosure financial assurance mechanism is not needed.

10. LIABILITY REQUIREMENTS 40 CFR 265.147

Rhone-Poulenc has provided (under separate cover) demonstration of financial responsibility for bodily injury and property damages to parties caused by sudden accidental occurrences arising from operations of the facility in the certificate of liability insurance. Rhone-Poulenc has prepared this demonstration for interim status requirements under 40 CFR 265.147. A copy of this document is included as Appendix E.

APPENDIX A WASTE ANALYSIS AND DESIGNATION

Appendix A

Waste Analysis Testing Results

			<u> </u>			
, 		Strainer Solids	Used Peneteck Oil Residue	Waste Shop Sol- vents (Kingsolv)	Methylene Chloride	Vanillin ^a Still Bottoms
	RCRA Characteristi	.cs				
,	Corrosive	No	No	No	No	No
	Ignitable	No	No	No	No	No
)	Reactive	No	No	No	No	No
}	EP Toxic	No	No	No	No	No
	WDOE Criteria					
b	Toxic (Aq.)	Yes	Yes	-	, -	No
ì	Persistent	No	No	-	-	No
•	Carcinogenic	-	-	-	-	_
Ì						
) 1						٠.
	RCRA Designation	None	None	None	F002	None
}	WDOE Designation	WT01	wrol	WT01	WT01	None

a This material is <u>not</u> a hazardous waste. See Appendix B.

APPENDIX B

VANILLIN STILL BOTTOMS INFORMATION

Appendix B

Vanillin Still Bottoms (VSB) is a by-product of the vanillin manufacturing process and is stored as solidified blocks on wooden pallets in an area adjacent to the storage area being closed. VSB is crushed and then sent to a cement company for use as kiln fuel, taking advantage of its high BTU value. VSB does not exhibit any of the RCRA characteristics for hazardous waste or Washington criteria for dangerous waste. Prior to 1986 this material was land-filled in a hazardous waste disposal facility and we, at that time, classed it conservatively as a WTO2 Dangerous Waste. Past uses of VSB include use as an extender in phenolic-based resin glue for plywood manufacture.

Based on currently available data, this product does not meet the OSHA definition of a hazardous substance. However, good industrial hygiene practices should be used in handling it.

Section 3. PHYSICAL DATA

Softening Point (°F):

232

Melting Point (°F):

248-302

Boiling Point (°F):

Not applicable

RHONE-POULENC PRODUCT NAME(S) VANILLIN STILL BOTTOMS

Section 3.	PHYSICAL	DATA	(Conti	inued)
------------	----------	------	--------	--------

Vapor Pressure (mmHq at 20°C): Not available

Vapor Density (air = 1): Not available

Solubility in Water: Insoluble

Specific Gravity: Not available

Evaporation Rate (butyl acetate = 1): Not applicable

% Volatile by Volume:
Negligible

Appearance/Odor: Black, brittle solid with a smooth, shiny

surface/vanillin odor

pH: Although this material is insoluble in

water, the pH of a well-stirred sample prepared with finely crushed material is

3.8.

Section 4. FIRE AND EXPLOSION HAZARD DATA

Flash Point (°F)/Method: 290/CC

Flammable Limits: LFL Not applicable UFL Not applicable

Extinguishing Media: (X) Water Fog (X) Foam

(X) Dry Chemical (X) ∞_2

(X) Other (specify): Any Class B extinguishing agent.

Special Fire Fighting Procedures:

Wear a NIOSH/MSHA approved self-contained breathing apparatus and full protective clothing. Cool containers exposed to fire with water.

Unusual Fire and Explosion Hazards: None.

Section 5. REACTIVITY DATA

Stability: () Unstable (X) Stable

Conditions to avoid: Open flame.

RHONE-POULENC PRODUCT NAME(S) VANILLIN STILL BOTTOMS

Section 5. REACTIVITY DATA	(Continued)					
Incompatibility (materials to () Water () () Reducing agents () () Other (specify):						
Hazardous Decomposition Produ On combustion, oxides of o						
Hazardous polymerization: ()	May occur (X) Will not occur					
Conditions to avoid: Not	t applicable .					
Section 6. HEALIH HAZARD DAY	Section 6. HEALIH HAZARD DATA/FIRST AID PROCEDURES					
EXPOSURE LIMITS IN AIR (TLV o	or suggested control figure)					
No TLV established for pro	educt or vanillin.					
EFFECIS OF SINGLE OVEREXPOSU	<u>.</u>					
Swallowing:	IOW ACUTE ORAL TOXICITY. Acute oral/rat ID50 is greater than 6310 mg/kg. (1)					
Skin Absorption:	IOW ACUTE DERMAL TOXICITY. Acute dermal/rabbit ID50 is greater than 7940 mg/kg. (1)					
Inhalation:	No data found.					
Skin Contact:	NON-IRRITATING. Skin Irritation (rabbit, 24 hr.): 0.0 on a scale of 8.0. (2)					

EFFECIS OF REPEATED OVEREXPOSURE:

Eye Contact:

Dermal and inhalation are expected to be the primary routes of occupational exposure to vanillin still bottoms. Occupational exposure to this material has not been reported to cause any significant adverse health effects.

1.3 on a scale 110.0. (2)

SLIGHTLY IRRITATING. Eye Irritation (rabbit, 24 hr.):

RHONE-POULENC PRODUCT NAME(S) VANILLIN STILL BOTTOMS

Section 6. HEALTH HAZARD DATA/FIRST AID PROCEDURES (Continued)

CARCINOGENICITY:

This product does not contain any ingredient designated by IARC, NTP, ACGIH or OSHA as a probable human carcinogen.

SIGNIFICANT LABORATORY DATA WITH POSSIBLE RELEVANCE TO MAN: No data found.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: No data found.

FIRST AID PROCEDURES

EYES: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes using an eyewash fountain. Lift upper and lower lids and rinse well under them. Get medical attention if irritation develops or persists.

SKIN: In case of contact, immediately wash with soap and plenty of water for at least 5 minutes. Remove contaminated clothing and shoes. Thoroughly clean contaminated clothing and shoes before reuse. Get medical attention if irritation develops or persists.

INHALATION:

Remove from area of exposure. Get medical attention as needed.

INGESTION:

If swallowed and victim is fully conscious, induce vomiting immediately by giving two glasses of water and sticking finger down throat. GET IMMEDIATE MEDICAL ATTENTION.

NOTE TO PHYSICIAN:

Treat symptomatically. No specific information found.

Section 7. PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:

Sweep, scoop or vacuum up all spilled material, contaminated soil and other contaminated material and place in clean, dry containers for disposal. Complete cleanup on a dry basis.

WASTE DISPOSAL METHOD:

Dispose of in accordance with Local, State and Federal regulations.

RHONE-POULENC PRODUCT NAME(S) VANILLIN STILL BOTTOMS

Section 7. PRECAUTIONS FOR SAFE HANDLING AND USE (Continued)

HANDLING AND STORAGE:

Store in leak proof containers. Avoid breathing dusts. Avoid direct or prolonged contact with skin and eyes. Wash hands thoroughly after handling. Do not rub eyes with soiled hands. Do not eat, drink or smoke in the work area.

OTHER PRECAUTIONS: None found.

Section 8. CONTROL MEASURES AND WORKER PROTECTION INFORMATION

Respiratory Protection (specify type):

None normally needed. Under dusting conditions, use NIOSH/MSHA approved air purifying respirator.

Ventilation:

Provide adequate ventilation. Use local exhaust as needed.

Protective Clothing:

Work uniform, gloves.

Eye Protection:

- (X) Safety Glasses with Side Shields
- () Chemical Workers Goggles
- () Gas-tight Goggles or Equivalent
- () Other (specify):

Other Protective Equipment:

Maintain a safety shower and eyewash fountain in the work area.

Section 9. REGULATORY STATUS

TSCA Inventory Status:

- (X) Product is TSCA certified.
- () Product is exempt from TSCA because it is FDA regulated.
- () Product is exempt from TSCA because it is FIFRA regulated.
- () Product is restricted to research and development use.

Transportation Status: Not regulated.

Reportable Quantity (RQ), under U.S. EPA CERCIA: Not applicable

RHONE-POULENC PRODUCT NAME(S) VANILLIN STILL BOTTOMS

Section 9. REGULATORY STATUS (Continued)

Specifically Listed under SARA Title III:

- () Section 302 Extremely Hazardous Substances
- () Section 313 Toxic Chemicals
- (X) Not listed

Section 10. REFERENCES

- (1) Unpublished toxicity studies.
- (2) Test Method Reference A.T.S. 5/74.

The information herein is given in good faith but no warranty, expressed or implied, is made.

APPENDIX C

MSDSs FOR DECONTAMINATION SOLUTION

WA 98188

VERSENE 1100 TETRASODIUM EDTA REVISION OF: 07-21-87

SHIP TO:

01001269 FORMULA CORPORATION For address

see page 1

ATTN: ALLEN

ORDER NO: 019501332

PROD NO: 04783908

VAN WATERS & ROGERS INC. 1600 NORTON BLDG. SEATTLE, WA 98104-1564 -----EMERGENCY ASSISTANCE----

FOR EMERGENCY ASSISTANCE INVOLVING CHEMICALS CALL CHEMTREC (800) 424-9300.

-----FOR PRODUCT AND SALES INFORMATION------

CONTACT YOUR LOCAL VAN WATERS & ROGERS BRANCH OFFICE

-----PRODUCT IDENTIFICATION----

PRODUCT NAME: VERSENE (R) 100 CHELATING AGENT CAS NO.: MIXTURE COMMON NAMES/SYNONYMS: AN AQUEOUS VW&R CODE: T1391001 MIXTURE OF THE TETRASODIUM SALT OF EDTA (NA 4 EDTA), THE DISODIUM SALT OF EDTA (NA 2 EDTA), AND THE TRISODIUM SALT OF NITRILOTRIACETIC ACID (NA 3 NTA).

FORMULA: MIXTURE HAZARD RATING (NFPA 704 CRITERIA)

HEAL TH: FIRE REACTIVITY: O NONE SPECIAL:

DATE ISSUED: 10/86 SUPERCEDES: 02/86 HAZARD RATING SCALE: O-MINIMAL 3-SERIOUS 1=SLIGHT 4-SEVERE

2=MODERATE

---HAZARDOUS INGREDIENTS-----

EXPOSURE LIMITS, MG/M3
OSHA ACGIH OTHER

% 37 COMPONENT CAS NO. PEL TLV LIMIT HAZARD NA 4 EDTA NA 3 EDTA NA 3 NTA 64-02-8 NONE NONE NONE NONE . 139-33-3 NONE NONE NONE NA 3 NTA 5064-31-3 SODIUM HYDROXIDE 1310-73-2 NONE NONE NONE CARC INDGEN NONE TOXIC: CORROSIVE 7732-18-5 BALANCE NONE WATER NONE NONE .

TRADEMARK OF THE DOW CHEMICAL COMPANY.

--PHYSICAL PROPERTIES--

---FIRST AID MEASURES-----

BOILING POINT, DEG F: 223 VAPOR PRESSURE, MM HG/20 DEG C: WATER MELTING POINT, DEG F: -24 VAPOR DENSITY (AIR=1): WATER SPECIFIC GRAVITY (WATER=1): 1.31 WATER SOLUBILITY, %: 100 APPEARANCE AND ODOR: EVAPORATION RATE (BUTYL ACETATE=1): <1 LIGHT STRAW - COLORED LIQUID, SLIGHT AMINE ODOR

IF INHALED: REMOVE TO FRESH AIR. GIVE ARTIFICIAL RESPIRATION IF NOT BREATHING. GET IMMEDIATE MEDICAL ATTENTION.

IN CASE OF EYE CONTACT: IMMEDIATELY FLUSH EYES WITH LOTS OF RUNNING

PROD: 04783908 14:10:23 10 MAR 1988 CUST: 01001269 INVOICE: 019501332

REVISION OF: 07-21-87

WATER FOR 30 MINUTES, LIFTING THE UPPER AND LOWER EYELIDS OCCASIONALLY. GET IMMEDIATE MEDICAL ATTENTION.

IN CASE OF SKIN CONTACT: IMMEDIATELY WASH SKIN WITH LOTS OF SOAP AND WATER. REMOVE CONTAMINATED CLOTHING AND SHOES; WASH BEFORE REUSE. GET MEDICAL ATTENTION IF IRRITATION PERSISTS AFTER WASHING.

IF SWALLOWED: DO NOT INDUCE VOMITING. IF CONSCIOUS, GIVE LOTS OF WATER OR MILK. GET IMMEDIATE MEDICAL ATTENTION. DO NOT GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSING PERSON.

NOTE TO PHYSICIAN: EYE IRRIGATION MAY BE NECESSARY FOR A TOTAL OF 45 MINUTES TO REMOVE AS MUCH CAUSTIC AS POSSIBLE. DURATION OF IRRIGATION AND TREATMENT IS AT THE DISCRETION OF MEDICAL PERSONNEL. CORROSIVE. MAY CAUSE STRICTURE. IF LAVAGE IS PERFORMED, SUGGEST ENDOTRACHEAL AND/OR ESOPHAGOSCOPIC CONTROL. CONTAINS CAUSTIC] IF BURN IS PRESENT, TREAT AS ANY THERMAL BURN, AFTER DECONTAMINATION. NO SPECIFIC ANTIDOTE. SUPPORTIVE CARE. TREATMENT BASED ON JUDGEMENT OF THE PHYSICIAN IN RESPONSE TO REACTIONS OF THE PATIENT.

PRIMARY ROUTES OF EXPOSURE: SKIN OR EYE CONTACT

SIGNS AND SYMPTOMS OF EXPOSURE

INHALATION: VAPORS ARE UNLIKELY DUE TO PHYSICAL PROPERTIES.

EYE CONTACT: VAPORS WILL IRRITATE THE EYES. LIQUID AND MISTS WILL IRRITATE AND MAY BURN THE EYES. MAY CAUSE BLINDNESS.

SKIN CONTACT: PROLONGED OR REPEATED CONTACT MAY CAUSE IRRITATION, OR EVEN A BURN. MAY CAUSE A MORE SEVERE RESPONSE IF CONFINED TO THE SKIN OR IF THE SKIN IS ABRADED. A SINGLE PROLONGED EXPOSURE IS NOT LIKELY TO RESULT IN HARMFUL QUANTTITIES BE ABSORBED.

SWALLOWED: LOW SINGLE DOSE ORAL TOXICITY.

CHRONIC EFFECTS OF EXPOSURE: REPEATED EXPOSURES ARE NOT ANTICIPATED TO CAUSE ANY SIGNIFICANT ADVERSE EFFECTS.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: NONE REPORTED.

-----TOXICITY DATA-----

DRAL: MALE RAT LD50 = 3030 MG/KG

DERMAL: RABBIT LD50 > 5000 MG/KG

INHALATION: NO DATA FOUND.

CARCINOGENICITY: THIS MATERIAL IS NOT CONSIDERED TO BE A CARCINOGEN BY THE NATIONAL TOXICOLOGY PROGRAM, THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER, OR THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION

OTHER DATA: NITRILOTRIACETIC ACID (NTA), A VERY SMALL COMPONENT OF THIS PRODUCT, IS CONSIDERED A POTENTIAL CARCINOGEN BY NTP. ALTHOUGH LARGE DIETARY DOSES OF NTA HAVE CAUSED URINARY TUMORS IN LABORATORY ANIMALS, THERE IS LITTLE LIKELIHOOD THAT NTA COULD CAUSE CANCER IN HUMANS, ESPECIALLY AT SUBTOXIC DOSES.

THE TRISODIUM SALT OF EDTA DID NOT CAUSE CANCER IN LABORATORY ANIMALS. BIRTH DEFECTS ARE UNLIKELY. EDTA AND ITS SODIUM SALTS HAVE BEEN REPORTED TO CAUSE BIRTH DEFECTS IN LABORATORY ANIMALS ONLY AT EXAGGERATED DOSES THAT WERE TOXIC TO THE MOTHER. THESE EFFECTS ARE LIKELY ASSOCIATED WITH ZINC DEFICIENCY DUE TO CHELATION. EXPOSURES HAVING NO EFFECT ON THE MOTHER SHOULD HAVE NO EFFECT ON THE FETUS. IN ANIMAL STUDIES, HAS BEEN SHOWN NOT TO INTERFERE WITH REPRODUCTION. MOST DATA INDICATE THAT EDTA AND ITS SALTS ARE NOT MUTAGENIC. MINIMAL EFFECTS REPORTED ARE LIKELY DUE TO TRACE METAL DEFICIENCIES RESULTING FROM CHELATION BY EDTA.

PROD: 04783908 14:10:23 10 MAR 1988 CUST: 01001269 INVDICE: 019501332

P1391001 MATERIAL SAFETY DATA SHEET 3 VERSENE 100 TETRASODIUM EDTA REVISION OF: 07-21-87 -----PERSONAL PROTECTION-----VENTILATION: GENERAL ROOM VENTILATION. RESPIRATORY PROTECTION: A RESPIRATOR IS NORMALLY NOT REQUIRED IF THIS PRODUCT IS USED WITH ADEQUATE VENTILATION. EYE PROTECTION: CHEMICAL GOGGLES AND FULL FACESHIELD UNLESS A FULL FACEPIECE RESPIRATOR IS ALSO WORN. IT IS GENERALLY RECOGNIZED THAT CONTACT LENSES SHOULD NOT BE WORN WHEN WORKING WITH CHEMICALS BECAUSE -EYE PROTECTION: CONTACT LENSES MAY CONTRIBUTE TO THE SEVERITY OF AN EYE INJURY. PROTECTIVE CLOTHING: LONG-SLEEVED SHIRT, TROUSERS, RUBBER BOOTS, RUBBER GLOVES, AND RUBBER APRON. OTHER PROTECTIVE MEASURES: AN EYEWASH AND SAFETY SHOWER SHOULD BE NEARBY AND READY FOR USE. --FIRE AND EXPLOSION INFORMATION----NONE FLAMMABLE LIMITS IN AIR, % LOWER: N/A UPPER: N/A FLASH POINT, DEG F: PMCC C LOWER: N/A UPPER: N USE WATER SPRAY, DRY CHEMICAL, CO2, OR ALCOHOL METHOD USED: EXTINGUISHING MEDIA: SPECIAL FIRE FIGHTING PROCEDURES: FIRE FIGHTERS SHOULD WEAR SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE CLOTHING. USE W USE WATER TO COOL NEARBY CONTAINERS AND STRUCTURES EXPOSED TO FIRE. UNUSUAL FIRE AND EXPLOSION HAZARDS: EXTINGUISH ALL NEARBY SOURCES OF IGNITION SINCE FLAMMABLE HYDROGEN GAS WILL BE LIBERATED FROM CONTACT WITH SOME METALS. -----HAZARDOUS REACTIVITY------STABILITY: STABLE POLYMERIZATION: WILL NOT OCCUR CONDITIONS TO AVOID: EXCESSIVE HEAT. MATERIALS TO AVOID: ACIDS, OXIDIZING MATERIALS, AND ALUMINUM. HAZARDOUS DECOMPOSITION PRODUCTS: MAY LIBERATE CARBON MONOXIDE, CARBON DIOXIDE, OXIDES OF NITROGEN, AND AMMONIA. ------SPILL, LEAK, AND DISPOSAL PROCEDURES------ACTION TO TAKE FOR SPILLS OR LEAKS: WEAR PROTECTIVE EQUIPMENT INCLUDING RUBBER BOOTS, RUBBER GLOVES, RUBBER APRON, AND A SELF-CONTAINED BREATHING APPARATUS IN THE PRESSURE DEMAND MODE OR A SUPPLIED-AIR RESPIRATOR. IF THE SPILL OR LEAK IS SMALL, A FULL FACEPIECE AIR-PURIFYING CARTRIDGE RESPIRATOR EQUIPPED FOR ORGANIC VAPORS MAY BE SATISFACTORY. IN ANY EVENT, ALWAYS WEAR EYE PROTECTION. FOR SMALL SPILLS OR DRIPS, MOP OR WIPE UP AND DISPOSE OF IN DOT-APPROVED WASTE CONTAINERS. FOR LARGE SPILLS, CONTAIN BY DIKING WITH SOIL OR OTHER NON-COMBUSTIBLE SORBENT MATERIAL AND THEN PUMP INTO DOT-APPROVED WASTE CONTAINERS; OR ABSORB WITH NON-COMBUSTIBLE SORBENT MATERIAL, PLACE RESIDUE IN DOT-APPROVED WASTE CONTAINERS. KEEP OUT OF SEWERS, STORM DRAINS, SURFACE WEAR PROTECTIVE EQUIPMENT INCLUDING WATERS, AND SOILS. COMPLY WITH ALL APPLICABLE GOVERNMENTAL REGULATIONS ON SPILL REPORTING, AND HANDLING AND DISPOSAL OF WASTE.

DISPOSAL METHODS: DISPOSE OF CONTAMINATED PRODUCT AND MATERIALS USED IN CLEANING UP SPILLS OR LEAKS IN A MANNER APPROVED FOR THIS MATERIAL. CONSULT APPROPRIATE FEDERAL, STATE AND LOCAL REGULATORY AGENCIES TO ASCERTAIN PROPER DISPOSAL PROCEDURES:
NOTE: EMPTY CONTAINERS CAN HAVE RESIDUES, GASES AND MISTS AND ARE SUBJECT TO PROPER WASTE DISPOSAL, AS ABOVE.

------SPECIAL PRECAUTIONS-----

STORAGE AND HANDLING PRECAUTIONS: STORE IN A COOL, DRY, WELL-VENTILATED PLACE AWAY FROM INCOMPATIBLE MATERIALS. VENT CONTAINER CAREFULLY, AS

PROD: 04783708 14:10:23 10 MAR 1988 CUST: 01001269 INVOICE: 019501332

REVISION OF: 07-21-87

NEEDED, TO RELIEVE PRESSURE. KEEP CONTAINER TIGHTLY CLOSED WHEN NOT IN USE. DO NOT USE PRESSURE TO EMPTY CONTAINER. WASH THOROUGHLY AFTER HANDLING. DO NOT GET IN EYES, ON SKIN, OR ON CLOTHING. DO NOT CONTACT WITH ALUMINUM SINCE FLAMMABLE HYDROGEN GAS WILL BE FORMED.

REPAIR AND MAINTENANCE PRECAUTIONS: DO NOT CUT, GRIND, WELD, OR DRILL ON OR NEAR THIS CONTAINER.

OTHER PRECAUTIONS: CONTAINERS, EVEN THOSE THAT HAVE BEEN EMPTIED, WILL RETAIN PRODUCT RESIDUE AND VAPORS. ALWAYS OBEY HAZARD WARNINGS AND HANDLE EMPTY CONTAINERS AS IF THEY WERE FULL.

-----FOR ADDITIONAL INFORMATION-----

CONTACT DOUGLAS EISNER, TECHNICAL DIRECTOR, VAN WATERS & ROGERS INC.
DURING BUSINESS HOURS, PACIFIC TIME (206)447-5911

----NOTICE-

**VAN WATERS & ROGERS INC. ("VW&R") EXPRESSLY DISCLAIMS ALL EXPRESS OR IMPLIED WARRENTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO THE PRODUCT OR INFORMATION PROVIDED HEREIN. **

ALL INFORMATION APPEARING HEREIN IS BASED UPON DATA OBTAINED FROM THE MANUFACTURER AND/OR RECOGNIZED TECHNICAL SOURCES. WHILE THE INFORMATION IS BELIEVED TO BE ACCURATE, VW&R MAKES NO REPRESENTATIONS AS TO ITS ACCURACY OR SUFFICIENCY. CONDITIONS OF USE ARE BEYOND VW&R'S CONTROL AND THEREFORE USERS ARE RESPONSIBLE TO VERIFY THIS DATA UNDER THEIR OWN OPERATING CONDITIONS TO DETERMINE WHETHER THE PRODUCT IS SUITABLE FOR THEIR PARTICULAR PURPOSES AND THEY ASSUME ALL RISKS OF THEIR USE, HANDLING, AND DISPOSAL OF THE PRODUCT, OR FROM THE PUBLICATION OR USE OF, OR RELIANCE UPON, INFORMATION CONTAINED HEREIN. THIS INFORMATION RELATES ONLY TO THE PRODUCT DESIGNATED HEREIN, AND DOES NOT RELATE TO ITS USE IN COMBINATION WITH ANY OTHER MATERIAL OR IN ANY OTHER PROCESS.

------REVISION-----

10/86: ADDED COMPONENT CAS NUMBERS AND NOTE TO PHYSICIAN. REVISED PERSONAL PROTECTION, FIRE FIGHTING INFORMATION, SPILL AND LEAK PROCEDURES, AND HANDLING ADVICE.

**** END OF .. MSDS ****

PROD: 04783908 14:10:23 10 MAR 1988 CUST: 01001269 INVOICE: 019501332

SODIUM TRIPOLYPHOSPHATE GRAN TECH

REVISION OF:06-14-88

SHIP TO:

01001269 FORMULA CORPORATION 2383 SOUTH 200TH

VAN WATERS & ROGERS INC.

SEATTLE

WA 98188

ORDER NO: 019538830 PROD NO: 04668852

SEATTLE, WA 98104-1564

-----EMERGENCY ASSISTANCE-----FOR EMERGENCY ASSISTANCE INVOLVING CHEMICALS CALL CHEMTREC

1600 NORTON BLDG.

-----FOR PRODUCT AND SALES INFORMATION---- -----

(800) 424-9300.

CONTACT YOUR LOCAL VAN WATERS & ROGERS BRANCH OFFICE

----PRODUCT IDENTIFICATION-----

PRODUCT NAME: SODIUM TRIPOLY-PHOSPHATE PENTASODIUM SALT. COMMON NAMES/SYNONYMS:

FORMULA: NA5 P3 010
HAZARD RATING (NFPA 701)
HEALTH: 0
FIRE: 0
REACTIVITY: 0

SPECIAL: NONE

CAS NO.: 7758-29-4 (ANHYDROUS)
CAS NO.: 15091-98-2 (HEXAHYDRATE)
VW&R CODE: T1407

DATE ISSUED: 11/87
SUPERCEDES: NONE
HAZARD RATING SCALE:
O:MINIMAL 3:SERIOUS
1:SLIGHT 4:SEVERE 2-MODERATE .

-----HAZARDOUS INGREDIENTS------

EXPOSURE LIMITS, PPI OSHA ACGIH OTHER PPM

COMPONENT CAS NO. SODIUM TRIPOLYPHOSPHATE 7758-29-4 PEL TLV LIMIT HAZARD 100 NONE NONE NONE

----PHYSICAL PROPERTIES-----

BOILING POINT, DEG F: N/A VAPOR PRESSURE, MM HG/20 DEG C: N/A MELTING POINT, DEG F: 1150 (ANHYDROUS) VAPOR DENSITY (AIR=1): N/A 158 DECOMPOSES (HEXAHYDRATE) WATER SOLUBILITY, %: 13 SPECIFIC GRAVITY (WATER=1): BULK DENSITY: 30-45, LBS/CU.FT. APPEARANCE AND ODOR: EVAPORATION RATE (BUTYL ACETATE=1): NIL NO ODOR; WHITE POWDER OR GRANULES.

-----FIRST AID MEASURES-----

IF INHALED: REMOVE TO FRESH AIR. GIVE ARTIFICIAL RESPIRATION IF NOT BREATHING. GET IMMEDIATE MEDICAL ATTENTION.

IN CASE OF EYE CONTACT: IMMEDIATELY FLUSH EYES WITH LOTS OF RUNNING TER FOR 15 MINUTES, LIFTING THE UPPER AND LOWER EYELIDS OCCASIONALLY. T IMMEDIATE MEDICAL ATTENTION.

CASE OF SKIN CONTACT: IMMEDIATELY WASH SKIN WITH LOTS OF SOAP AND TER. REMOVE CONTAMINATED CLOTHING AND SHOES; WASH BEFORE REUSE. GET DICAL ATTENTION IF IRRITATION PERSISTS AFTER WASHING.

IF SWALLOWED: DO NOT INDUCE VOMITING. GET IMMEDIATE MEDICAL ATTENTION.

PRIMARY ROUTES OF EXPOSURE: INHALATION, SKIN OR EYE CONTACT.

SIGNS AND SYMPTOMS OF EXPOSURE INHALATION: NONE CURRENTLY KNOWN.

EYE CONTACT: DUSTS MAY IRRITATE THE EYES.

SKIN CONTACT: NO IRRITATION IS LIKELY AFTER BRIEF CONTACT BUT MAY BE IRRITATING AFTER PROLONGED CONTACT.

SWALLOWED: GASTROINTESTINAL UPSETS POSSIBLE.

CHRONIC EFFECTS OF EXPOSURE: NO SPECIFIC INFORMATION AVAILABLE.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: NONE REPORTED.

------DXICITY DATA-----

ORAL: RAT LD50 = 6500 MG/KG

DERMAL: NO DATA FOUND

INHALATION: NO DATA FOUND

CARCINOGENICITY: THIS MATERIAL IS NOT CONSIDERED TO BE A CARCINOGEN BY THE NATIONAL AGENCY FOR PSEARCH ON CANCER, OR THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION

HER DATA: NONE

-----PERSONAL PROTECTION-----

VENTILATION: LOCAL MECHANICAL EXHAUST VENTILATION CAPABLE OF MINIMIZING DUST EMISSIONS AT THE POINT OF USE.

RESPIRATORY PROTECTION: IF USE CONDITIONS GENERATE DUSTS, WEAR A NIOSH-APPROVED RESPIRATOR APPROPRIATE FOR THOSE EMISSION LEVELS. APPROPRIATE RESPIRATORS MAY BE A FULL FACEPIECE OR A HALF MASK AIR-PURIFYING CART-RIDGE RESPIRATOR WITH PARTICULATE FILTERS, A SELF-CONTAINED BREATHING APPARATUS IN THE PRESSURE DEMAND MODE, OR A SUPPLIED-AIR RESPIRATOR.

EYE PROTECTION: CHEMICAL GOGGLES. IT IS GENERALLY RECOGNIZED THAT CONTACT LENSES SHOULD NOT BE WORN WHEN WORKING WITH CHEMICALS BECAUSE CONTACT LENSES MAY CONTRIBUTE TO THE SEVERITY OF AN EYE INJURY.

PROTECTIVE CLOTHING: LONG-SLEEVED SHIRT, TROUSERS, SAFETY SHOES, AND GLOVES.

OTHER PROTECTIVE MEASURES: AN EYEWASH AND SAFETY SHOWER SHOULD BE NEARBY AND READY FOR USE.

-----FIRE AND EXPLOSION INFORMATION------

FLASH POINT. DEG F: NON-FLAMMABLE FLAMMABLE LIMITS IN AIR. %
METHOD USED: N/D LOWER: N/A UPPER: N/A
EXTINGUISHING MEDIA: THIS MATERIAL IS NOT COMBUSTIBLE. USE EXTINGUISHING MEDIA APPROPRIATE FOR SURROUNDING FIRE.

SPECIAL FIRE FIGHTING PROCEDURES: FIRE FIGHTERS SHOULD WEAR SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE CLOTHING. USE WATER SPRAY TO COOL NEARBY CONTAINERS AND STRUCTURES EXPOSED TO FIRE.

JSUAL FIRE AND EXPLOSION HAZARDS: NONE.

And the second

STABILITY: STABLE CONDITIONS TO AVOID: NONE

POLYMERIZATION: WILL NOT OCCUR

MATERIALS TO AVOID: WATER SOLUTIONS WILL ATTACK ALUMINUM AND LIBERATE HYDROGEN.

HAZARDOUS DECOMPOSITION PRODUCTS: NONE

-----SPILL. LEAK. AND DISPOSAL PROCEDURES----

ACTION TO TAKE FOR SPILLS OR LEAKS: WEAR PROTECTIVE EQUIPMENT INCLUDING RUBBER BOOTS, RUBBER GLOVES, RUBBER APRON, AND A FULL FACEPIECE OR A HALF MASK AIR-PURIFYING CARTRIDGE RESPIRATOR WITH PARTICULATE FILTERS. WEAR CHEMICAL GOGGLES IF A HALF MASK IS WORN. FOR SMALL SPILLS, SWEEP UP AND DISPOSE OF IN DOT-APPROVED WASTE CONTAINERS. FOR LARGE SPILLS, SHOVEL INTO DOT-APPROVED WASTE CONTAINERS. KEEP OUT OF SEWERS, STORM DRAINS, SURFACE WATERS, AND SOIL. COMPLY WITH ALL APPLICABLE GOVERNMENTAL REGULATIONS ON SPILL REPORTING, AND HANDLING AND DISPOSAL OF WASTE.

DISPOSAL METHODS: DISPOSE OF CONTAMINATED PRODUCT AND MATERIALS USED IN CLEANING UP SPILLS OR LEAKS IN A MANNER APPROVED FOR THIS MATERIAL. CONSULT APPROPRIATE FEDERAL, STATE AND LOCAL REGULATORY AGENCIES TO ASCERTAIN PROPER DISPOSAL PROCEDURES. NOTE: EMPTY CONTAINERS CAN HAVE RESIDUES, GASES AND MISTS AND ARE SUBJECT TO PROPER WASTE DISPOSAL, AS ABOVE.

-----SPECIAL PRECAUTIONS-

STORAGE AND HANDLING PRECAUTIONS: STORE IN A COOL, DRY, WELL-VENTILATED PLACE AWAY FROM INCOMPATIBLE MATERIALS. KEEP BAGS OR FIBER DRUMS DRY AT TIMES. WASH THOROUGHLY AFTER HANDLING. DO NOT GET IN EYES, ON IN, OR ON CLOTHING.

REPAIR AND MAINTENANCE PRECAUTIONS: NONE.

OTHER PRECAUTIONS: THIS PRODUCT MAY BE INTENDED FOR USE IN FOOD, ANIMAL FEED, DRUG, OR COSMETIC MANUFACTURE AND IT HAS BEEN PRODUCED AND PACKAGED IN ACCORDANCE WITH STRICT QUALITY PRACTICES. MAINTAIN THIS QUALITY LEVEL BY STORING THIS PRODUCT AWAY FROM OTHER CHEMICALS, HANDLING IT WITH CARE, AND AVOIDING ALL SOURCES OF CONTAMINATION.

-----FOR ADDITIONAL INFORMATION-----

CONTACT DOUGLAS EISNER, TECHNICAL DIRECTOR, VAN WATERS & ROGERS INC.
DURING BUSINESS HOURS, PACIFIC TIME (206)447-5911

----NOTICE------

**VAN WATERS & ROGERS INC. ("VW&R") EXPRESSLY DISCLAIMS ALL EXPRESS.
OR IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO THE PRODUCT OR INFORMATION PROVIDED HEREIN.**

ALL INFORMATION APPEARING HEREIN IS BASED UPON DATA OBTAINED FROM THE MANUFACTURER AND/OR RECOGNIZED TECHNICAL SOURCES. WHILE THE INFORMATION IS BELIEVED TO BE ACCURATE, VW&R MAKES NO REPRESENTATIONS AS TO ITS ACCURACY OR SUFFICIENCY. CONDITIONS OF USE ARE BEYOND VW&R'S CONTROL AND THEREFORE USERS ARE RESPONSIBLE TO VERIFY THIS DATA UNDER THEIR OWN OPERATING CONDITIONS TO DETERMINE WHETHER THE PRODUCT IS SUITABLE FOR THEIR PARTICULAR PURPOSES AND THEY ASSUME ALL RISKS OF THEIR USE, HANDLING, AND DISPOSAL OF THE PRODUCT, OR FROM THE PUBLICATION OR USE OF, OR RELIANCE UPON, INFORMATION CONTAINED HEREIN. THIS INFORMATION RELATES ONLY TO THE PRODUCT DESIGNATED HEREIN, AND DOES NOT RELATE TO ITS USE IN COMBINATION WITH ANY OTHER MATERIAL OR IN ANY OTHER PROCESS.

POPULATE STATE **** END OF MSDS

-4001CE: 019538830

Material Sa

Stepan 5

Stepen Company Northfield, IL 60093 **Emergency Telephone: (312) 446-7500**

S Chemtrec: 1-800-424-8300

SECTION 1: PRODUCT DATA

Product Name: MACON 6 (275)
Product Class: ETHOTYLATED BORYL PRESOL

NP6

Date: 48/13/85

SECTION 2: HAZARDOUS INGREDIENTS

..

SECTION & PHYSICAL DATA

Boiling Point:) 100 DEG. F (200 C)

% Volatile by Weight:

Special Fire Fighting Procedures: MOT APPLICABLE.

Unusual Fire and Explosion Hazards: USE OF WATER ON RUPTURED CON-

Emergency and First Aid Precautions: FLUSH EYES IRREDIATELY WITH

Flash Point:

SLIPPERY FLOORS.

> 200 BEG.F (93 C) P M.C.C.

TAINERS MAY CAUSE FORFING SPILLED MATERIAL MAY CAUSE

PLENTY OF WATER FOR AT LEAST 15 RIQUES. WASH OFF SKIN AND

REROUE CONTARINATED CLOTHING

IF VAPORS OR HIST CAUSE IRRI-

FRESH AIR GIVE OXYGEN OR APPLY

MEEDED IF ANY SYMPTOMS PERSIST CONSULT A PHYSICIAN.

TATION OR DISTRESS. CO TO

ARTIFICIAL RESPIRATION. IF

Evaporation Rate: (Ethyl Ether= 1)

Vapor Density: 31 (Air = 1)

Vapor Pressure (mm Hg): (10 mm of Mg @ 70 DEG.F(20 C)

Effects of Overexposure: CONTACT WITH EYES WILL BE

PAINFUL AND IRRITATING, PRO-LONGED OR REPEATED CONTACT

WITH SKIR MAY CAUSE IRRITA-

TION. HIST CAUSED BY MANUFAC-

MASAL PASSAGES.

TURING OPERATIONS MAY IRRITATE

Weight per Gallon: ARGUT 8.98

SECTION 4: FIRE AND EXPLOSION DATA

DOT Category:

Extinguishing Media:

MATER. CARBON DIDITOE. DRY CMENICAL OR FOAM CLASS A. BC. OR ADC FIRE EXTINGUISHERS

LEL: ABOUT 4 2/ EST

SECTION 5: HEALTH HAZARD DATA

Threshold Limit Value: TAIN SHALL AROUNTS OF ETHYLERE OXIDE (EO) WHICH COULD ACCURU-LATE IN THE HEADSPACE OF STOR-ACE AND TRANSPORT VESSELS REPEATED/PROLONGED AIRBORNE EXPOSURES TO EO MAY BE MARMFUL SINCE EO IS A CANCER AND RE-PRODUCTIVE HAZARO

OSHA MAS ESTABLISHED A 1 0 PPR 8-HOUR THE FOR EO (29 CFR 1920 1097) SOME REQUIREMENTS OF THIS STANDARD BAY APPLY TO YOUR OPERATION

SECTION B: REACTIVITY DATA

STABLE Stability: Hazardous Polymerization: WILL NOT DECUR

SECTION 7: SPILL OR LEAK PROCEDURES

SORK UP HITH ABSORBENT. SHOUEL INTO WASTE CONTAINER. FLUSH AREA ULTH WATER

Hazardous Decomposition Products: MOT APPLICABLE

Incompatability: (Materials to Avoid)

STRONG CHIDIZING ACENTS.

SECTION 8: SPECIAL PROTECTION INFORMATION

Eve Protection: MEAR COCCLES OR FULL FACE SMIELD IF SPLASHING IS LIKELY Protective Gloves:

USE RUBBER OF PLASTIC CLOUES TO PREVENT PROLONGED CONTACT

SECTION 9: SPECIAL PRECAUTIONS

Handling and Storage: AUDID OPER FIRE OR FLAME. Respiratory Protection:

Waste Disposal Method:

SEMACE DISPOSAL SYSTEM IN ACCORDANCE WITH ALL LEGAL RE-

CULATIONS

BURY. INCIDERATE. OR FLUSH TO

IF UAPORS ARE PRESENT USE A BESA OR MIOSH APPROVED CAS BASK FOR ORGANIC UAPORS. FRESH AIR BREATHING APPARATUS OR A SELF-CONTAINED DREATHING AF PARATUS.

Ventilation:

USE ADEQUATE VERTILATION.

Other Protective Equipment: HEAR PROTECTIVE CLOTHING TO PREUERT REPEATED OR PROLONCED CORTACT.

Other Precautions: DO NOT INCEST.

MATERIAL SAFETY DATA SHEET

VANWET 9N9 NONIONIC SURFACTANT

REVISION OF: 01-10-89

ORDER NO: 019548634

PROD NO: 04064774

MAIL TO:

01001269 FORMULA CORPORATION ATTN: ALLEN 2383 SOUTH 200TH

GET IMMEDIATE MEDICAL ATTENTION.

SEATTLE

WA 78188

VAN WATERS & ROGERS INC. 1600 NORTON BLDG. SEATTLE, WA 78104-1564 -----EMERGENCY ASSISTANCE-----FOR EMERGENCY ASSISTANCE INVOLVING CHEMICALS CALL CHEMTREC (800) 424-9300. -----FOR PRODUCT AND SALES INFORMATION-------CONTACT YOUR LOCAL VAN WATERS & ROGERS BRANCH OFFICE -----PRODUCT IDENTIFICATION------PRODUCT NAME: VANWET 9N9
COMMON NAMES/SYNONYMS: A NONYLPHENOL CAS NO.: 26027-38-3 T3185001 SURFACTANT DATE ISSUED: 12/88 SUPERCEDES: 04/87 HEALTH: HAZARD RATING SCALE: O-MINIMAL 3-SERIOUS FIRE: REACTIVITY: 1=5LIGHT 4=SEVERE SPECIAL: NONE 2=MODERATE EXPOSURE LIMITS, PPM DSHA ACGIH OTHER COMPONENT CAS NO. z PEL TLV LIMIT HAZARD 26027~38~3 NONE VANWET 9N9 >99 NONE NONE IRRITANT ETHYLENE DXIDE 0. 5 75-21-8 TRACE CARC INDGEN (OSHA ACTION) -----PHYSICAL PROPERTIES----BOILING POINT, DEG F: >482 VAPOR PRESSURE, MM HG/20 DEG C: NIL (DECOMPOSES) MELTING POINT, DEG F: VAPOR DENSITY (AIR=1): 37 >1 SPECIFIC GRAVITY (WATER=1): 1.057 WATER SOLUBILITY, %: 3.2 APPEARANCE AND ODOR: EVAPORATION RATE (BUTYL ACETATE=1): NIL CLOUDY LIQUID; MILD ODOR -----FIRST AID MEASURES------IF INHALED: REMOVE TO FRESH AIR. GIVE ARTI BREATHING. GET IMMEDIATE MEDICAL ATTENTION. GIVE ARTIFICIAL RESPIRATION IF NOT

PROD: 04064774 16:36:59 12 FEB 1989 CUST: 01001269 INVOICE: 019548634

IN CASE OF EYE CONTACT: IMMEDIATELY FLUSH EYES WITH LOTS OF RUNNING WATER FOR 15 MINUTES, LIFTING THE UPPER AND LOWER EYELIDS OCCASIONALLY.

2

VANWET 9N9 NONIONIC SURFACTANT

REVISION OF: 01-10-89

IMMEDIATELY WASH SKIN WITH LOTS OF SOAP AND IN CASE OF SKIN CONTACT: WATER. REMOVE CONTAMINATED CLOTHING AND SHOES; WASH BEFORE REUSE. MEDICAL ATTENTION IF IRRITATION PERSISTS AFTER WASHING.

IF SWALLOWED: DO NOT INDUCE VOMITING. IF CONSCIOUS, GIVE LOTS OF WATER. GET IMMEDIATE MEDICAL ATTENTION. DO NOT GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSING PERSON.

-----HEALTH HAZARD INFORMATION-------------

PRIMARY ROUTES OF EXPOSURE: SKIN OR EYE CONTACT

SIGNS AND SYMPTOMS OF EXPOSURE

MISTS MAY CAUSE CHEST DISCOMFORT AND COUGHING. INHALATION:

EYE CONTACT: VAPORS WILL IRRITATE THE EYES. LIGUID AND MISTS WILL IRRITATE AND MAY BURN THE EYES, POSSIBLY CAUSING PERMANENT INJURY.

SKIN CONTACT: BRIEF CONTACT MAY DRY THE SKIN. PROLONGED OR PEATED CONTACT MAY IRRITATE THE SKIN, CAUSING DERMATITIS. PROLOGOR REPEATED CONTACT MAY ALSO RESULT IN THE ABSORPTION OF HARMFUL PROLONGED OR RE-PROLONGED AMOUNTS.

SWALLOWED: SWALLOWING LARGE QUANTITIES MAY CAUSE NAUSEA AND. VOMITING.

CHRONIC EFFECTS OF EXPOSURE: NO SPECIFIC INFORMATION AVAILABLE.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: NONE REPORTED.

-----TOXICITY DATA------

ORAL: NO DATA FOUND

DERMAL: NO DATA FOUND

✓INHALATION: NO DATA FOUND

CARCINOGENICITY: THIS MATERIAL IS NOT CONSIDERED TO BE A CARCINOGEN BY THE NATIONAL TOXICOLOGY PROGRAM, THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER, OR THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION

OTHER DATA: THIS PRODUCT MAY CONTAIN TRACE AMOUNTS OF ETHYLENE OXIDE, A CONDITION WHICH CREATES THE POTENTIAL FOR ACCUMULATION OF ETHYLENE OXIDE IN THE HEAD SPACE OF SHIPPING AND STORAGE CONTAINERS OR IN ENCLOSED AREAS WHERE THE PRODUCT IS BEING HANDLED OR USED. IF THE PRODUCT IS HANDLED ACCORDING TO THE RECOMMENDATIONS IN THIS MATERIAL SAFETY DATA SHEET, THE PRESENCE OF THESE TRACE AMOUNTS OF ETHYLENE OXIDE IS NOT EXPECTED TO RESULT IN ANY SHORT- OR LONG-TERM HAZARD. ETHYLENE OXIDE IS CONSIDERED BY OSHA AS A POTENTIAL CARCINOGEN FOR HUMANS. USERS OF THIS PRODUCT SHOULD CONFIRM THAT THEIR OPERATING, STORAGE AND DISTRIBUTION FACILITIES COMPLY WITH THE OSHA STANDARD (29 CFR 1910.1047). PERSONNEL SHOULD BE MONITORED FOR A SUFFICIENT PERIOD OF TIME TO DETERMINE IF THERE IS EXPOSURE TO ETHYLENE OXIDE ABOVE THE PERMISSIBLE LEVELS AND, IF NECESSARY, PRECAUTIONARY AND PROTECTIVE MEASURES SHOULD BE TAKEN TO KEEP ETHYLENE OXIDE PERSONNEL EXPOSURE LIMITS BELOW THE OSHA PERMISSIBLE LEVEL OF 1 PPM TWA(8) EXPOSURE LIMITS BELOW THE OSHA PERMISSIBLE LEVEL OF 1 PPM TWA(8) AND THE ACTION LEVEL OF 0.5 PPM TWA(8).

VENTILATION: LOCAL MECHANICAL EXHAUST VENTILATION CAPABLE OF MINIMIZING EMISSIONS AT THE POINT OF USE.

RESPIRATORY PROTECTION: WEAR A NIOSH-APPROVED RESPIRATOR APPROPRIATE FOR THE VAPOR OR MIST CONCENTRATION AT THE POINT OF USE. APPROPRIATE RESPIRATORS MAY BE A FULL FACEPIECE OR A HALF MASK AIR-PURIFYING CARTRIDGE RESPIRATOR EQUIPPED FOR ORGANIC VAPORS/MISTS, A SELF-CONTAINED BREATHING APPARATUS IN THE PRESSURE DEMAND MODE, OR A SUPPLIED-AIR RESPIRATOR.

PROD: 04064774 16:36:39 12 FEB 1989 CUST: 01001269 INVOICE: 019548634

3

EYE PROTECTION: CHEMICAL GOGGLES UNLESS A FULL FACEPIECE RESPIRATOR IS ALSO WORN. IT IS GENERALLY RECOGNIZED THAT CONTACT LENSES SHOULD NOT BE WORN WHEN WORKING WITH CHEMICALS BECAUSE CONTACT LENSES MAY CONTRIBUTE TO THE SEVERITY OF AN EYE INJURY.

PROTECTIVE CLOTHING: LONG-SLEEVED SHIRT, TROUSERS, SAFETY SHOES, AND GLOVES.

OTHER PROTECTIVE MEASURES: AN EYEWASH AND SAFETY SHOWER SHOULD BE NEARBY AND READY FOR USE.

------FIRE AND EXPLOSION INFORMATION------

FLASH POINT, DEG F: 477

METHOD USED: PMCC

EXTINGUISHING MEDIA: USE WATER SPRAY, DRY CHEMICAL, CO2, OR ALCOHOL FOAM.

SPECIAL FIRE FIGHTING PROCEDURES: FIRE FIGHTERS SHOULD WEAR SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE CLOTHING. USE WATER SPRAY TO COOL NEARBY CONTAINERS AND STRUCTURES EXPOSED TO FIRE.

UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE.

STABILITY: STABLE POLYMERIZATION: WILL NOT OCCUR CONDITIONS TO AVOID: EXCESSIVE HEAT

MATERIALS TO AVOID: STRONG ALKALIS AT HIGH TEMPERATURES, STRONG ACIDS, STRONG OXIDIZERS, AND MATERIALS REACTIVE WITH HYDROXYL COMPOUNDS.

HAZARDOUS DECOMPOSITION PRODUCTS: MAY LIBERATE CARBON MONOXIDE, CARBON DIOXIDE, AND UNIDENTIFIED ORGANIC COMPOUNDS IN BLACK SMOKE.

------SPILL, LEAK, AND DISPOSAL PROCEDURES---------

ACTION TO TAKE FOR SPILLS OR LEAKS: WEAR PROTECTIVE EQUIPMENT INCLUDING RUBBER BOOTS, RUBBER GLOVES, RUBBER APRON, AND A SELF-CONTAINED BREATHING APPARATUS IN THE PRESSURE DEMAND MODE OR A SUPPLIED-AIR RESPIRATOR. IF THE SPILL OR LEAK IS SMALL, A FULL FACEPIECE AIR-PURIFYING CARTRIDGE RESPIRATOR EQUIPPED FOR CRGANIC VAPORS MAY BE SATISFACTORY. IN ANY EVENT, ALWAYS WEAR EYE PROTECTION. FOR SMALL SPILLS OR DRIPS, MOP OR WIPE UP AND DISPOSE OF IN DOT-APPROVED WASTE CONTAINERS. FOR LARGE SPILLS, CONTAIN BY DIKING WITH SOIL OR OTHER NON-COMBUSTIBLE SORBENT MATERIAL AND THEN PUMP INTO DOT-APPROVED WASTE CONTAINERS; OR ABSORB WITH NON-COMBUSTIBLE SORBENT MATERIAL, PLACE RESIDUE IN DOT-APPROVED WASTE CONTAINERS. KEEP OUT OF SEWERS, STORM DRAINS, SURFACE WATERS, AND SOILS. THIS PRODUCT IS HIGHLY TOXIC TO AQUATIC LIFE.

COMPLY WITH ALL APPLICABLE GOVERNMENTAL REGULATIONS ON SPILL REPORTING, AND HANDLING AND DISPOSAL OF WASTE.

DISPOSAL METHODS: DISPOSE OF CONTAMINATED PRODUCT AND MATERIALS USED IN CLEANING UP SPILLS OR LEAKS IN A MANNER APPROVED FOR THIS MATERIAL. CONSULT APPROPRIATE FEDERAL, STATE AND LOCAL REGULATORY AGENCIES TO ASCERTAIN PROPER DISPOSAL PROCEDURES.
NOTE: EMPTY CONTAINERS CAN HAVE RESIDUES, GASES AND MISTS AND ARE SUBJECT TO PROPER WASTE DISPOSAL, AS ABOVE.

-----SPECIAL PRECAUTIONS---------

STORAGE AND HANDLING PRECAUTIONS: STORE IN A DRY, WELL-VENTILATED PLACE AWAY FROM INCOMPATIBLE MATERIALS. KEEP CONTAINER TIGHTLY CLOSED WHEN NOT IN USE! DO NOT USE PRESSURE TO EMPTY CONTAINER. WASH THOROUGHLY AFTER HANDLING. DO NOT GET IN EYES, ON SKIN, OR ON CLOTHING. STORE AT TEMPERATURES ABOVE 39 DEGREES F. TO PROTECT FROM FREEZING.

REPAIR AND MAINTENANCE PRECAUTIONS: DO NOT CUT, GRIND, WELD, OR DRILL ON OR NEAR THIS CONTAINER.

PROD: 04064774 16:36:59 12 FEB 1989 CUST: 01001269 INVOICE: 019548634

VANWET 9N9 NONIONIC SURFACTANT

REVISION OF: 01-10-89

THER PRECAUTIONS: CONTAINERS, EVEN THOSE THAT HAVE BEEN EMPTIED, WILL RETAIN PRODUCT RESIDUE AND VAPORS. ALWAYS OBEY HAZARD WARNINGS AND HANDLE EMPTY CONTAINERS AS IF THEY WERE FULL.

-----FOR ADDITIONAL INFORMATION------

CONTACT DOUGLAS EISNER, TECHNICAL DIRECTOR, VAN WATERS & ROGERS INC. DURING BUSINESS HOURS, PACIFIC TIME (206)447-5911

THIS PRODUCT CONTAINS THE FOLLOWING CHEMICAL(S) CONSIDERED BY THE STATE OF CALIFORNIA'S SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986 (PROPOSITION 65) AS CAUSING CANCER OR REPRODUCTIVE TOXICITY AND FOR WHICH WARNINGS ARE NOW REQUIRED:

CHEMICAL .

ETHYLENE OXIDE

75-21-8

**VAN WATERS & ROGERS INC. ("VW&R") EXPRESSLY DISCLAIMS ALL EXPRESS OR IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO THE PRODUCT OR INFORMATION PROVIDED HEREIN. **

-----NOTICE----

ALL INFORMATION APPEARING HEREIN IS BASED UPON DATA OBTAINED FROM THE MANUFACTURER AND/OR RECOGNIZED TECHNICAL SOURCES. WHILE THE INFORMATION IS BELIEVED TO BE ACCURATE, VW2R MAKES NO REPRESENTATIONS AS TO ITS ACCURACY OR SUFFICIENCY. CONDITIONS OF USE ARE BEYOND VW2R'S CONTROL AND THEREFORE USERS ARE RESPONSIBLE TO VERIFY THIS DATA UNDER THEIR OWN OPERATING CONDITIONS TO DETERMINE WHETHER THE PRODUCT IS SUITABLE FOR THEIR PARTICULAR PURPOSES AND THEY ASSUME ALL RISKS OF THEIR USE, HANDLING, AND DISPOSAL OF THE PRODUCT, OR FROM THE PUBLICATION OR USE OF, OR RELIANCE UPON, INFORMATION CONTAINED HEREIN. THIS INFORMATION RELATES ONLY TO THE PRODUCT DESIGNATED HEREIN, AND DOES NOT RELATE TO ITS USE IN COMBINATION WITH ANY OTHER MATERIAL OR IN ANY OTHER RELATE TO ITS USE IN COMBINATION WITH ANY OTHER MATERIAL OR IN ANY OTHER PROCESS.

04/87: CORRECTED CAS NUMBER.

12/88: ADDED OTHER REGULATORY INFORMATION.

END *** MSDS

PROD: 04064774 16:36:59 12 FEB 1989 CUST: 01001269 INVOICE: 019548634

REVISION OF:07-21-87

SHIP TO:

01001269 FÖRMÜLA CORPORATION ATTN: ALLEN 2383 SOUTH 200TH

SEATTLE

WA 98188

ORDER NO: 019545257 PROD NO: 04830462

1600 NORTON BLDG. SEATTLE, WA 98104-1564 VAN WATERS & ROGERS INC. -----EMERGENCY ASSISTANCE-----

FOR EMERGENCY ASSISTANCE INVOLVING CHEMICALS CALL CHEMITEC (800) 424-9300.

-----FOR PRODUCT AND SALES INFORMATION-----

CONTACT YOUR LOCAL VAN WATERS & ROGERS BRANCH OFFICE

RODUCT NAME: GLYCOL ETHER EB CAS NO.: 111-76-2
COMMON NAMES/SYNONYMS: ETHYLENE GLYCOL VW&R CODE: T1081
MC"OBUTYL ETHER; 2-BUTOXYETHANOL; BUTYL CELLOSOLVE (1); DOWANOL (2) EB;
MC"OBUTYL GAS NO.: 111-76-2
COMMON NAMES/SYNONYMS: ETHER CAS NO.: 111-76-2
COMMON NAMES/SYNONYMS: ETHER CAS NO.: 111-76-2
COMMON NAMES/SYNONYMS: ETHYLENE CAS NO.: 111-76-2
COMMON NAMES/SYNONYMS: ETHYLENE CAS NO.: 111-76-2
COMMON NAMES/SYNONYMS: ETHYLENE CAS NO.: 111-76-2
COMMON NAMES/SYNONYMS: ETHYLENE CAS NO.: 111-76-2
COMMON NAMES/SYNONYMS: ETHYLENE GLYCOL CELLOSOLVE (1); DOWANOL (2) EB;
COMMON NAMES/SYNONYMS: ETHYLENE GLYCOL ETHER

kMULA: C6 H14 O2 HAZARD RATING (NFPA 325M) HEALTH: 2 FIRE: 2

REACTIVITY: 0 SPECIAL: NONE

DATE ISSUED: 09/86 SUPERCEDES: 02/86 HAZARD RATING SCALE: O=MINIMAL 3=SERIOUS 1=SLIGHT 4=SEVERE 2=MODERATE

-----HAZARDOUS INGREDIENTS-----

EXPOSURE LIMITS, PPM OSHA ACGIH OTHER PEL 50 1LV 25 COMPONENT LIMIT (SKIN) (SKIN) NONE ETHYLENE GLYCOL MONOBUTYL ETHER >99

HAZARI TOXIC: COMBUSTIBLE

TRADEMARK OF UNION CARBIDE CORPORATION TRADEMARK OF THE DOW CHEMICAL COMPANY TRADEMARK OF OLIN CORPORATION TRADEMARK OF SHELL CHEMICAL COMPANY (1) (2) (3)

-----PHYSICAL PROPERTIES-----

BOILING POINT, DEG F: 340 VAPO MELTING POINT, DEG F: -95 SPECIFIC GRAVITY (WATER=1): 0.902 APPEARANCE AND ODOR: CLEAR, EVAPORAT COLORLESS LIQUID; MILD ODOR VAPOR PRESSURE, MM HG/20 DEG C: 0.6
VAPOR DENSITY (AIR=1): 4.1
0.902 WATER SOLUBILITY, %: 100
EVAPORATION RATE (BUTYL ACETATE=1): <1

IF INHALED: REMOVE TO FRESH AIR. GIVE ARTIFICIAL RESPIRATION IF NOT

CASE OF EYE CONTACT: IMMEDIATELY FLUSH EYES WITH LOTS OF RUNNING TER FOR 15 MINUTES, LIFTING THE UPPER AND LOWER EYELIDS OCCASIONALLY.

REVISION OF:07-21-87

GLYCOL ETHER EB VW&R

IMMEDIATE MEDICAL ATTENTION.

A CASE OF SKIN CONTACT: IMMEDIATELY FLOOD SKIN WITH LOTS OF RUNNING WATER FOR 15 MINUTES. REMOVE CONTAMINATED CLOTHING AND SHOES. GET MEDICAL ATTENTION IF IRRITATION PERSISTS AFTER FLOODING. WASH CLOTHING BEFORE REUSE. DESTROY CONTAMINATED SHOES.

IF SWALLOWED: IF CONSCIOUS, IMMEDIATELY INDUCE VOMITING BY GIVING 2 GLASSES OF WATER AND STICKING A FINGER DOWN THE THROAT. GET IMMEDIATE MEDICAL ATTENTION. DO NOT GIVE ANYTHING TO AN UNCONSCIOUS OR CONVULSING PERSON.

-----INFORMATION------HEALTH HAZARD INFORMATION------

PRIMARY ROUTES OF EXPOSURE: SKIN OR EYE CONTACT

SIGNS AND SYMPTOMS OF EXPOSURE
INHALATION: VAPORS AND MISTS IRRITATE THE NOSE AND THROAT. INHALATION OF HIGHER CONCENTRATIONS MAY CAUSE HEADACHES, NAUSEA, VOMITING,
AND COMA. INHALATION OF VERY HIGH CONCENTRATIONS OR PROLONGED EXPOSURE
MAY CAUSE UNCONSCIOUSNESS.

EYE CONTACT: VAPORS WILL IRRITATE THE EYES. LIQUID AND MISTS WILL IRRITATE AND MAY DAMAGE THE EYES, CAUSING CORNEAL INJURY.

SKIN CONTACT: BRIEF CONTACT MAY CAUSE LIGHT REDDENING. MORE PRO-LONGED OR REPEATED CONTACT MAY CAUSE MODERATE REDDENING, SWELLING, AND POSSIBLE SKIN DAMAGE. THIS PRODUCT IS READILY ABSORBED THROUGH THE SKIN. FREQUENT OR WIDESPREAD CONTACT MAY ABSORB HARMFUL AMOUNTS. THE SIGNS AND SYMPTOMS OF TOXICITY ARE SIMILAR TO THOSE OF SWALLOWING AND INHALATION.

SWALLOWED: MODERATELY TOXIC. MAY CAUSE HEADACHE, DIZZINESS, NAUSEA, VOMITING, AND DIARRHEA. SWALLOWING MAY ALSO CAUSE RED BLOOD C'EL HEMOLYSIS AND FOSSIBLE LIVER, KIDNEY, AND LUNG INJURY.

RONIC EFFECTS OF EXPOSURE: REPEATED OVEREXPOSURE MAY CAUSE DAMAGE TO THE LIVER, KINNEYS, LUNGS, AND RED BLOOD CELLS CAUSING BLOOD IN THE URINE. REPEATED SKIN CONTACT MAY ABSORB HARMFUL AMOUNTS.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: PERSONS WITH PRE-EXISTING DERMATITIS MAY BE MORE SUSCEPTIBLE TO THE EFFECTS OF THIS MATERIAL.

-----TOXICITY DATA-----

ORAL: RAT LD50 = 470 MG/KG; RABBIT LD50 = 320 MG/KG

DERMAL: RABBIT LD50 = 220 MG/KG

'INHALATION: MOUSE LC50 = 700 PPM / /HR: HUMAN TCLO = 195 PPM / 8HR

CARCINOGENICITY: THIS MATERIAL IS NOT CONSIDERED TO BE A CARCINOGEN BY THE NATIONAL TOXICOLOGY PROGRAM. THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER, OR THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION

OTHER DATA: INHALATION EXPOSURE OF PREGNANT RABBITS CAUSED SOME TOXICITY TO THE MOTHER AND FETUS AT 200 PPM, BUT THERE WERE NO EFFECTS AT 100 PPM AND BELOW. INHALATION EXPOSURE TO PREGNANT RATS CAUSED SOME TOXICITY TO THE MOTHER AND FETUS AT 200 PPM AND 100 PPM, BUT THERE WERE NO EFFECTS AT 50 PPM AND BELOW. THIS PRODUCT DID NOT CAUSE BIRTH DEFECTS IN EITHER STUDY. RAT STUDIES INDICATE THE KIDNEYS MAY BE THE TARGET ORGANS FOR OVEREXPOSURE BUT SOME LIVER CHANGES MAY ALSO BE EVIDENT.

-----PERSONAL PROTECTION-----

VENTILATION: LOCAL MECHANICAL EXHAUST VENTILATION CAPABLE OF MAIN-TAINING EMISSIONS AT THE POINT OF USE BELOW THE PEL.

PIRATORY PROTECTION: WEAR A NIOSH-APPROVED SELF-CONTAINED BREATHING ARATUS IN THE PRESSURE DEMAND MODE, OR A SUPPLIED-AIR RESPIRATOR.

PROD: 04830462 15:28:45 16 JAN 1989 CUST: 01001269 INVOXCE: 019545257

GLYCOL ETHER EB VW&R

FROTECTION: CHEMICAL GOGGLES UNLESS A FULL FACEPIECE RESPIRATOR IS SO WORN. IT IS GENERALLY RECOGNIZED THAT CONTACT LENSES SHOULD NOT BY WORN WHEN WORKING WITH CHEMICALS BECAUSE CONTACT LENSES MAY CONTRIBUTE TO THE SEVERITY OF AN EYE INJURY.

PROTECTIVE CLOTHING: LONG-SLEEVED SHIRT, TROUSERS, SAFETY SHOES, RUBBER GLOVES, AND RUBBER APRON.

OTHER PROTECTIVE MEASURES: AN EYEWASH AND SAFETY SHOWER SHOULD BE NEARBY AND READY FOR USE.

------FIRE AND EXPLOSION INFORMATION---------

FLASH POINT, DEG F: 150 FLAMMABLE LIMITS IN AIR, % METHOD USED: TCC LOWER: 1.1 UPPER: 10.6 EXTINGUISHING MEDIA: USE WATER SPRAY, DRY CHEMICAL, CO2, OR ALCOHOL FOAM.

SPECIAL FIRE FIGHTING PROCEDURES: FIRE FIGHTERS SHOULD WEAR SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE CLOTHING. USE USPRAY TO COOL NEARBY CONTAINERS AND STRUCTURES EXPOSED TO FIRE. USE WATER

UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE.

-----HAZARDOUS REACTIVITY------

STABILITY: STABLE FOLYMERIZATION: WILL NOT OCCUR CONDITIONS TO AVOID: HEAT, SPARKS, AND OPEN FLAMES.

MATERIALS TO AVOID: ALKALIS, OXIDIZING MATERIALS, WATER, AND MOIST AIR.

HAZARDOUS DECOMPOSITION PRODUCTS: MAY LIBERATE CARBON MONOXIDE, CARBON D'AXIDE, AND UNIDENTIFIED ORGANIC COMPOUNDS IN BLACK SMOKE.

------SPILL. LEAK. AND DISPOSAL PROCEDURES-------

ACTION TO TAKE FOR SPILLS OR LEAKS: WEAR PROTECTIVE EQUIPMENT INCLUDING RUBBER BOOTS, RUBBER GLOVES, RUBBER APRON, AND A SELF-CONTAINED BREATHING APPARATUS IN THE PRESSURE DEMAND MODE OR A SUPPLIED-AIR RESPIRATOR. EXTINGUISH ALL IGNITION SOURCES AND ENSURE THAT ALL HANDLING EQUIPMENT IS ELECTRICALLY GROUNDED. FOR SMALL SPILLS OR DRIPS, MOP OR WIPE UP AND DISPOSE OF IN DOT-APPROVED WASTE CONTAINERS. FOR LARGE SPILLS, CONTAIN BY DIKING WITH SOIL OR OTHER NON-COMBUSTIBLE ABSORBENT MATERIAL AND THEN PUMP INTO DOT-APPROVED WASTE CONTAINERS; OR ABSORB WITH NON-COMBUSTIBLE SORBENT MATERIAL, PLACE RESIDUE IN DOT-APPROVED WASTE CONTAINERS. KEEP OUT OF SEWERS, STORM DRAINS, SURFACE WATERS, AND

COMPLY WITH ALL APPLICABLE GOVERNMENTAL REGULATIONS ON SPILL REPORTING, AND HANDLING AND DISPOSAL OF WASTE.

DISPOSAL METHODS: DISPOSE OF CONTAMINATED PRODUCT AND MATERIALS USED IN CLEANING UP SPILLS OR LEAKS IN A MANNER APPROVED FOR THIS MATERIAL. CONSULT APPROPRIATE FEDERAL, STATE AND LOCAL REGULATORY AGENCIES TO ASCERTAIN PROPER DISPOSAL PROCEDURES. NOTE: EMPTY CONTAINERS CAN HAVE RESIDUES, GASES AND MISTS AND ARE SUBJECT TO PROPER WASTE DISPOSAL, AS ABOVE.

-----PRECAUTIONS-----

HANDLING AND STORAGE PRECAUTIONS: KEEP AWAY FROM HEAT, SPARKS, AND FLAMES. STORE IN A COOL, DRY, WELL-VENTILATED PLACE AWAY FROM INCOMPATIBLE MATERIALS. ELECTRICALLY GROUND ALL EQUIPMENT WHEN HANDLING THIS PRODUCT AND USE ONLY NON-SPARKING TOOLS. KEEP CONTAINER TIGHTLY CLOSED WHEN NOT IN USE. 300 NOT USE PRESSURE TO EMPTY CONTAINER. WASH THOROUGHLY AFTER HANDLING. DO NOT GET IN EYES, ON SKIN, OR ON CLOTHING. DO NOT STORE THIS PRODUCT IN ALUMINUM CONTAINERS.

AIR AND MAINTENANCE PRECAUTIONS: DO NOT CUT, GRIND, WELD, OR DRILL OR NEAR THIS CONTAINER.

PROD: 04880462 15:28:45 16 JAN 1989 CUST: 01001269 INVOICE: 019545257

SLYCOL ETHER EB VW&R

REVISION OF:07-21-87

ER PRECAUTIONS: CONTAINERS, EVEN THOSE THAT HAVE BEEN EMPTIED, WILL AIN PRODUCT RESIDUE AND VAPORS. ALWAYS OBEY HAZARD WARNINGS AND HOLE EMPTY CONTAINERS AS IF THEY WERE FULL.

-----FOR ADDITIONAL INFORMATION-------

CONTACT DOUGLAS EISNER, TECHNICAL DIRECTOR, VAN WATERS & ROGERS INC.
DURING BUSINESS HOURS, FACIFIC TIME (206)447-5911

-----NOTICE-----

*VAN WATERS & ROGERS INC. ("VW&R") EXPRESSLY DISCLAIMS ALL EXPRESS R IMPLIED WARRENTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR URPOSE, WITH RESPECT TO THE PRODUCT OR INFORMATION PROVIDED HEREIN.**

ALL INFORMATION APPEARING HEREIN IS BASED UPON DATA OBTAINED FROM THE ANUFACTURER AND/OR RECOGNIZED TECHNICAL SOURCES. WHILE THE INFORMATION IS BELIEVED TO BE ACCURATE, VW&R MAKES NO REPRESENTATIONS AS TO ITS ACCURACY OR SUFFICIENCY. CONDITIONS OF USE ARE BEYOND VW&R'S CONTROL AND THEREFORE USERS ARE RESPONSIBLE TO VERIFY THIS DATA UNDER THEIR OWN OPERATING CONDITIONS TO DETERMINE WHETHER THE PRODUCT IS DITABLE FOR THEIR PARTICULAR PURPOSES AND THEY ASSUME ALL RISKS OF HEIR USE, HANDLING, AND DISPOSAL OF THE PRODUCT, OR FROM THE PUBLICATION OR USE OF, OR RELIANCE UPON, INFORMATION CONTAINED HEREIN. THIS INFORMATION RELATES UNLY TO THE PRODUCT DESIGNATED HEREIN, AND DOES NOT ELATE TO ITS USE IN COMBINATION WITH ANY OTHER MATERIAL OR IN ANY OTHER ROCESS.

-----REVISION-----

786: ADDED SYNONYMS. REVISED NFPA REFERENCE AND FIRST AID FOR SKIN INTACT. EXPANDED HAZARDS FOR EYE AND SKIN CONTACT. CORRECTED ANIMAL TOXICITY DATA. EXPANDED RESPIRATORY AND EYE PROTECTION, FIRE FIGHTING INFORMATION; SPILL AND LEAK PROCEDURES, AND HANDLING ADVICE.

**** END OF MSDS ****

PROD: 04830462 15:28:45 16 JAN 1989 CUST: 01001269 INVOICE: 019545257

BIO SURF PBC-430

REVISION OF: 07-21-87

ORDER NO: 019501763

PROD NO:

04076762

SHIP TO:

01001269 FORMULA CORPORATION 2383 SOUTH 200TH

SEATTLE ATTN: ALLEN WA 98188

SEATTLE, WA 98104-1564 VAN WATERS & ROGERS INC. 1600 NORTON BLDG. -----EMERGENCY ASSISTANCE-----FOR EMERGENCY ASSISTANCE INVOLVING CHEMICALS CALL CHEMTREC (800) 424-9300. -----FOR PRODUCT AND SALES INFORMATION----CONTACT YOUR LOCAL VAN WATERS & ROGERS BRANCH OFFICE -----PRODUCT IDENTIFICATION----PRODUCT NAME: BIO-SURF PBC-430 COMMON NAMES/SYNONYMS: A NONYLPHENDXY POLYETHOXYETHANOL PHOSPHATE ESTER (NPPEEP) CAS NO.: 51811-79-1 VW&R CODE: T2863003 DATE ISSUED: 12/86 SUPERCEDES: NONE UNDEFINED AZARD RATING (NFPA 704 CRITERIA) HEALTH: 2 FIRE: 1 REACTIVITY: 0 SPECIAL: NONE HAZARD RATING SCALE: O=MINIMAL 3=SERIOUS 1=5LIGHT 4=SEVERE 2=MODERATE -----HAZARDOUS INGREDIENTS----EXPOSURE LIMITS, PPM ACGIH OTHER OSHA COMPONENT CAS NO. PEL TLV LIMIT HAZARD NPPEEP

51811-79-1 >99 NONE NONE NONE

-----PHYSICAL PROPERTIES------

BOILING POINT, DEG F: N/D VAPOR PRESSURE, MM HG/20 DEG C: N/D VAPOR DENSITY (AIR=1): N/D SPECIFIC GRAVITY (WATER=1): 1.11

WATER SOLUBILITY, %: COM-PLETE

EYE IRRITANT

APPEARANCE AND ODOR: VISCOUS, EVAPORATION RATE (BUTYL ACETATE=1): N/D

LIGHT AMBER LIQUID

-----FIRST AID MEASURES-----

IF INHALED: REMOVE TO FRESH AIR. GIVE ARTIFICIAL RESPIRATION IF NOT GET IMMEDIATE MEDICAL ATTENTION. BREATHING.

IN CASE OF EYE CONTACT: IMMEDIATELY FLUSH EYES WITH LOTS OF RUNNING WATER FOR 15 MINUTES, LIFTING THE UPPER AND LOWER EYELIDS OCCASIONALLY. GET IMMEDIATE MEDICAL ATTENTION.

IN CASE OF SKIN CONTACT: IMMEDIATELY WASH SKIN WITH LOTS OF SOAP AND WATER. REMOVE CONTAMINATED CLOTHING AND SHOES; WASH BEFORE REUSE. GIEDICAL ATTENTION IF IRRITATION PERSISTS AFTER WASHING.

PROD: 04076762 16:42:21 14 MAR 1988 CUST: 01001269 INVOICE: 019501763

BIO SURF PBC-430

REVISION OF: 07-21-87

IF SWALLOWED: IF CONSCIOUS, IMMEDIATELY INDUCE VOMITING BY GIVING 2 LASSES OF WATER AND STICKING A FINGER DOWN THE THROAT. GET IMMEDIATE EDICAL ATTENTION. DO NOT GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSING PERSON.

PRIMARY ROUTES OF EXPOSURE: SKIN OR EYE CONTACT

SIGNS AND SYMPTOMS OF EXPOSURE INHALATION: NONE CURRENTLY KNOWN.

EYE CONTACT: VAPORS WILL IRRITATE THE EYES. LIQUID AND MISTS WILL IRRITATE AND MAY BURN THE EYES.

SKIN CONTACT: BRIEF CONTACT MAY DRY THE SKIN. PROLONGED OR RE-PEATED CONTACT MAY IRRITATE THE SKIN, CAUSING DERMATITIS.

SWALLOWED: SWALLOWING LARGE GUANTITIES MAY CAUSE NAUSEA AND VOMITING.

CHRONIC EFFECTS OF EXPOSURE: NO SPECIFIC INFORMATION AVAILABLE.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: NONE REPORTED.

----TOXICITY DATA-----

ORAL: NO DATA FOUND.

DERMAL: NO DATA FOUND.

INHALATION: NO DATA FOUND.

CARCINDGENICITY: THIS MATERIAL IS NOT CONSIDERED TO BE A CARCINOGEN BY THE NATIONAL TOXICOLOGY PROGRAM, THE INTERNATIONAL AGENCY FOR "ESEARCH ON CANCER, OR THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION

OTHER DATA: NONE.

-----PERSONAL PROTECTION-----

VENTILATION: LOCAL MECHANICAL EXHAUST VENTILATION CAPABLE OF MINIMIZING EMISSIONS AT THE POINT OF USE.

RESPIRATORY PROTECTION: IF USE CONDITIONS GENERATE VAPORS OR MISTS, WEAR A NIOSH-APPROVED RESPIRATOR APPROPRIATE FOR THOSE EMISSION LEVELS. APPROPRIATE RESPIRATORS MAY BE A FULL FACEPIECE OR A HALF MASK AIR-PURIFYING CARTRIDGE RESPIRATOR EQUIPPED FOR ORGANIC VAPORS/MISTS, A SELF-CONTAINED BREATHING APPARATUS IN THE PRESSURE DEMAND MODE, OR A SUPPLIED-AIR RESPIRATOR.

EYE PROTECTION: CHEMICAL GOGGLES UNLESS A FULL FACEPIECE RESPIRATOR IS ALSO WORN. IT IS GENERALLY RECOGNIZED THAT CONTACT LENSES SHOULD NOT BE WORN WHEN WORKING WITH CHEMICALS BECAUSE CONTACT LENSES MAY CONTRIBUTE TO THE SEVERITY OF AN EYE INJURY.

PROTECTIVE CLOTHING: LONG-SLEEVED SHIRT, TROUSERS, SAFETY SHOES, RUBBER GLOVES, AND RUBBER APRON.

OTHER PROTECTIVE MEASURES: AN EYEWASH AND SAFETY SHOWER SHOULD BE NEARBY AND READY FOR USE.

----FIRE AND EXPLOSION INFORMATION-----

FLASH POINT, DEG F: >200 FLAMMABLE LIMITS IN AIR, %
METHOD USED? N/D LOWER: N/D UPPER: N/D
EXTINGUISHING MEDIA: USE WATER SPRAY, DRY CHEMICAL, CO2, OR ALCOHOL
FOAM.

SPECIAL FIRE FIGHTING PROCEDURES: FIRE FIGHTERS SHOULD WEAR SELF-ONTAINED BREATHING APPARATUS AND FULL PROTECTIVE CLOTHING. USE WATER

PROD: 04076762 16:42:21 14 MAR 1988 CUST: 01001269 INVOICE: 019501763

BIO SURF PBC-430

REVISION OF: 07-21-87

RPRAY TO COOL NEARBY CONTAINERS AND STRUCTURES EXPOSED TO FIRE.

MUSUAL FIRE AND EXPLOSION HAZARDS: NONE.

------HAZARDOUS REACTIVITY-----

POLYMERIZATION: WILL NOT OCCUR
EXCESSIVE HEAT AND CONTAMINATION OF ANY KIND. STABILITY: STABLE CONDITIONS TO AVOID:

MATERIALS TO AVOID: OXIDIZERS.

HAZARDOUS DECOMPOSITION PRODUCTS: MAY LIBERATE CARBON MONDXIDE OR CARBON DIOXIDE.

-----SPILL, LEAK, AND DISPOSAL PROCEDURES-

ACTION TO TAKE FOR SPILLS OR LEAKS: WEAR PROTECTIVE EQUIPMENT INCLUDING RUBBER BOOTS, RUBBER GLOVES, RUBBER APRON, AND A SELF-CONTAINED BREATHING APPARATUS IN THE PRESSURE DEMAND MODE OR A SUPPLIED-AIR RESPIRATOR. IF THE SPILL OR LEAK IS SMALL, A FULL FACEPIECE AIR-PURIFYING CARTRIDGE RESPIRATOR EQUIPPED FOR ORGANIC VAPORS MAY BE SATISFACTORY. IN ANY EVENT, ALWAYS WEAR EYE PROTECTION. FOR SMALL SPILLS OR DRIPS, MOP OR WIPE UP AND DISPOSE OF IN DOT-APPROVED WASTE CONTAINERS. FOR LARGE SPILLS, CONTAIN BY DIKING WITH SOIL OR OTHER NON-COMBUSTIBLE SORBENT MATERIAL AND THEN PUMP INTO DOT-APPROVED WASTE CONTAINERS; OR ABSORB WITH NON-COMBUSTIBLE SORBENT MATERIAL, PLACE RESIDUE IN DOT-APPROVED WASTE CONTAINERS. KEEP OUT OF SEWERS, STORM DRAINS, SURFACE KEEP OUT OF SEWERS, STORM DRAINS, SURFACE APPROVED WASTE CONTAINERS. WATERS, AND SOILS.
COMPLY WITH ALL APPLICABLE GOVERNMENTAL REGULATIONS ON SPILL REPORTING, AND HANDLING AND DISPOSAL OF WASTE.

DISPOSAL METHODS: DISPOSE OF CONTAMINATED PRODUCT AND MATERIALS USED IN CLEANING UP SPILLS OR LEAKS IN A MANNER APPROVED FOR THIS MATERIAL. CONSULT APPROPRIATE FEDERAL, STATE AND LOCAL REGULATORY AGENCIES TO ASCERTAIN PROPER DISPOSAL PROCEDURES.

DIE: EMPTY CONTAINERS CAN HAVE RESIDUES, GASES AND MISTS AND ARE BJECT TO PROPER WASTE DISPOSAL, AS ABOVE.

-----SPECIAL PRECAUTIONS--

STORAGE AND HANDLING PRECAUTIONS: STORE IN A COOL, DRY, WELL-VENTILATED PLACE AWAY FROM INCOMPATIBLE MATERIALS. KEEP CONTAINER TIGHTLY CLOSED WHEN NOT IN USE. DO NOT USE PRESSURE TO EMPTY CONTAINER. WASH THOROUGHLY AFTER HANDLING. DO NOT GET IN EYES, ON SKIN, OR ON CLOTHING. WELL-VENTILATED

REPAIR AND MAINTENANCE PRECAUTIONS: NONE.

OTHER PRECAUTIONS: CONTAINERS, EVEN THOSE THAT HAVE BEEN EMPTIED, WILL RETAIN PRODUCT RESIDUE AND VAPORS. ALWAYS OBEY HAZARD WARNINGS AND HANDLE EMPTY CONTAINERS AS IF THEY WERE FULL.

-----FOR ADDITIONAL INFORMATION-----

CONTACT DOUGLAS EISNER, TECHNICAL DIRECTOR, VAN WATERS & ROGERS INC. DURING BUSINESS HOURS, PACIFIC TIME (206)447-5911

----NDTICE--

**VAN WATERS & ROGERS INC. ("VW&R") EXPRESSLY DISCLAIMS ALL EXPRESS OR IMPLIED WARRENTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO THE PRODUCT OR INFORMATION PROVIDED HEREIN. **

ALL INFORMATION APPEARING HEREIN IS BASED UPON DATA OBTAINED FROM THE MANUFACTURER AND/OR RECOGNIZED TECHNICAL SOURCES. WHILE THE INFORMATION IS BELIEVED TO BE ACCURATE, VW&R MAKES NO REPRESENTATIONS AS TO ITS ACCURACY OR SUFFICIENCY. CONDITIONS OF USE ARE BEYOND VW&R'S CONTROL AND THEREFORE USERS ARE RESPONSIBLE TO VERIFY THIS DATA UNDER THEIR OWN OPERATING CONDITIONS TO DETERMINE WHETHER THE PRODUCT IS SUITABLE FOR THEIR PARTICULAR PURPOSES AND THEY ASSUME ALL RISKS OF HEIR USE, HANDLING, AND DISPOSAL OF THE PRODUCT, OR FROM THE PUBLICATION OR USE OF, OR RELIANCE UPON, INFORMATION CONTAINED HEREIN. THIS

PROD: 04076762 16:42:21 14 MAR 1988 CUST: 01001269 INVDICE: 019501763

P2863003

MATERIAL SAFETY DATA SHEET

PG

BIO SURF PBC-430

REVISION OF: 07-21-87

INFORMATION RELATES ONLY TO THE PRODUCT DESIGNATED HEREIN, AND DOES NOT ELATE TO ITS USE IN COMBINATION WITH ANY OTHER MATERIAL OR IN ANY OTHER PROCESS.

**** END OF MSD5 ****

PROD: 04076762 16:42:21 14 MAR 1988 CUST: 01001269 INVOICE: 019501763

APPENDIX D

FINANCIAL ASSURANCE INFORMATION

TRUST AGREEMENT

TRUST AGREEMENT, the "Agreement," entered into as of August 23, 1988 by and between Rhone-Poulenc Inc, a New York Corporation, the "Grantor," and Connecticut National Bank, a "national bank", the "Trustee."

WHEREAS, the Washington State Department of Ecology "WDOE," an agency of the Washington State Government, has established certain regulations applicable to the Grantor, requiring that an owner or operator of a dangerous waste management facility shall provide assurance that funds will be available when needed for closure and/or post-closure care of the facility,

WHEREAS, the Grantor has elected to establish a trust to provide all or part of such financial assurance for the facilities identified herein,

WHEREAS, the Grantor, acting through its duly authorized officers, has selected the Trustee to be the trustee under this agreement, and the Trustee is willing to act as trustee,

NOW, THEREFORE, the Grantor and the Trustee agree as follows:

Section 1. Definitions. As used in this Agreement:

- (a) The term "Grantor" means the owner or operator who enters into this Agreement and any successors or assigns of the Grantor.
- (b) The term "Trustee" means the Trustee who enters into this Agreement and any successor Trustee.
- Section 2. Identification of Facilities and Cost Estimates. This Agreement pertains to the facilities and cost estimates identified on attached Schedule A.
- Section 3. Establishment of Fund. The Grantor and the Trustee hereby establish a trust fund, the "Fund," for the benefit of WDOE. The Grantor and the Trustee intend that no third party have access to the Fund except as herein provided. The Fund is established initially as consisting of the property, which is acceptable to the Trustee, described in Schedule B attached hereto. Such property and any other property subsequently transferred to the Trustee is referred to as the Fund, together with all earnings and profits thereon, less any payments of distributions made by the Trustee pursuant to this Agreement. The Fund shall be held by the Trustee, IN TRUST, as hereinafter provided. The Trustee shall not be responsible nor shall it undertake any responsibility for the amount or adequacy of, nor any duty to collect from the Grantor, any payments necessary to discharge any liabilities of the Grantor established by WDOE.

- Section 4. Payment for Closure and Post-Closure Care. The Trustee shall make payments from the Fund as WDOE shall direct, in writing, to provide for the payment of the costs of closure and/or post-closure care of the facilities covered by this Agreement. The Trustee shall reimburse the Grantor or other persons as specified by WDOE from the Fund for closure and post-closure expenditures in such amounts as WDOE shall direct in writing. In addition, the Trustee shall refund to the Grantor such amounts as WDOE specifies in writing. Upon refund, such funds shall no longer constitute part of the Fund as defined herein.
- Section 5. Payments Comprising the Fund. Payments made to the Trustee for the Fund shall consist of cash or securities acceptable to the Trustee.
- Section 6. Trustee Management. The Trustee shall invest and reinvest the principal and income of the Fund and keep the Fund invested as a single fund, without distinction between principal and income, in accordance with general investment policies and guidelines which the grantor may communicate in writing to the Trustee from time to time, subject, however, to the provisions of this Section. In investing, reinvesting, exchanging, selling, and managing the Fund, the Trustee shall discharge his duties with respect to the trust fund solely in the interest of the beneficiary and with the care, skill, prudence, and diligence under the circumstances then prevailing which persons or prudence, acting in a like capacity and familiar with such matters, would use in the conduct of an enterprise of a like character and with like aims; except that:
- (i) Securities or other obligations of the Grantor, or any other owner or operator of the facilities, or any of their affiliates as defined in the Investment Company Act of 1940, as amended, 15 U.S.C. 80a-2.(a), shall not be acquired or held, unless they are securities or other obligations of the Federal or a State government;
- (ii) The Trustee is authorized to invest the Fund in time or demand deposits of the Trustee, to the extent insured by an agency of the Federal or State government; and
- (iii) The Trustee is authorized to hold cash awaiting investment or distribution uninvested for a reasonable time and without liability for the payment of interest thereon.
- Section 7. Commingling and Investment. The Trustee is expressly authorized in its discretion:
- (a) To transfer from time to time any or all of the assets of the Fund to any common, commingled, or collective trust fund created by the Trustee in which the Fund is eligible to participate, subject to all of the provisions thereof to

be commingled with the assets of other trusts participating therein; and

- (b) To purchase shares in any investment company registered under the Investment Company Act of 1940, 15 U.S.C. 80a-1 et seq., including one which may be created, managed, underwritten, or to which investment advice is rendered or the shares of which are sold by the Trustee. The Trustee may vote such shares in its discretion.
- Section 8. Express Powers of Trustee. Without in any way limiting the powers and discretions conferred upon the Trustee by the other provisions of this Agreement or by law, the Trustee is expressly authorized and empowered:
- (a) To sell, exchange, convey, transfer, or otherwise dispose of any property held by it, by public or private sale. No person dealing with the Trustee shall be bound to see to the application of the purchase money or to inquire into the validity or expediency of any such sale or other disposition;
- (b) To make, execute, acknowledge, and deliver any and all documents of transfer and conveyance and any and all other instruments that may be necessary or appropriate to carry out the powers herein granted;
- (c) To register any securities held in the Fund in its own name or in the name of a nominee and to hold any security in bearer form or in book entry, or to combine certificates representing such securities with certificates of the same issue held by the Trustee in other fiduciary capacities, or to deposit or arrange for the deposit of such securities in a qualified central depository even though, when so deposited, such securities may be merged and held in bulk in the name of the nominee of such depository with other securities deposited therein by another person, or to deposit or arrange for the deposit of any securities issued by the United States Government, or any agency or instrumentality thereof, with a Federal Reserve bank, but the books and records of the Trustee shall at all times show that all such securities are part of the Fund;
- (d) To deposit any cash in the Fund in interest-bearing accounts maintained or savings certificates issued by the Trustee, in its separate corporate capacity, or in any other banking institution affiliated with the Trustee, to the extent insured by an agency of the Federal or State government; and
- (e) To compromise or otherwise adjust all claims in favor of or against the Fund.

Section 9. Taxes and Expenses. All taxes of any kind that may be assessed or levied against or in respect of the Fund and all brokerage commissions incurred by the Fund shall be paid from the Fund. All other expenses incurred by the Trustee in connection with the administration of this Trust, including fees for legal services rendered to the Trustee, the compensation of the Trustee to the extent not paid directly by the Grantor, and all other proper charges and disbursements of the Trustee shall be paid from the Fund.

Section 10. Annual Valuation. The Trustee shall annually, at *\frac{1}{2} least 30 days prior to the anniversary date of establishment of the Fund, furnish to the Grantor and to WDOE a statement confirming the value of the Trust. Any securities in the Fund shall be valued at market value as of no more than 60 days prior to the anniversary date of establishment of the fund. The failure of the Grantor to object in writing to the Trustee within 90 days after the statement has been furnished to the Grantor and WDOE shall constitute a conclusively binding assent by the Grantor, barring the Grantor from asserting any claim or liability against the Trustee with respect to matters disclosed in the statement.

Section 11. Advice of Counsel. The Trustee may from time to time consult with counsel, who may be counsel to the Grantor, with respect to any question arising as to the construction of this Agreement or any action to be taken hereunder. The Trustee shall be fully protected, to the extent permitted by law, in acting upon the advice of counsel.

Section 12. Trustee Compensation. The Trustee shall be entitled to reasonable compensation for its services as agreed upon in writing from time to time with the Grantor.

Section 13. Successor Trustee. The Trustee may resign or the Grantor may replace the Trustee, but such resignation or replacement shall not be effective until the Grantor has appointed a successor Trustee and this successor accepts the appointment. The successor trustee shall have the same powers and duties as those conferred upon the Trustee hereunder.

Upon the successor trustee's acceptance of the appointment, the Trustee shall assign, transfer, and pay over to the successor trustee the funds and properties then constituting the Fund. If for any reason the Grantor cannot or does not act in the event of the resignation of the Trustee, the Trustee may apply to a court of competent jurisdiction for the appointment of a successor trustee or for instruction. The successor trustee shall specify the date on which it assumes administration of the trust in a writing sent to the Grantor, WDOE, and the present Trustee by certified mail 10 days before such change becomes effective. Any expenses incurred by the Trustee as a result of any of the acts contemplated by this Section shall be paid as provided in Section 9.

Section 14. Instructions to the Trustee. All orders, requests, and instructions by the Grantor to the Trustee shall be in writing, signed by such persons as are designated in the attached Exhibit A or such other designees as the Grantor may designate by amendment to Exhibit A. The Trustee shall be fully protected in acting without inquiry in accordance with the Grantor's orders, requests, and instructions. All orders, requests, and instructions by WDOE to the Trustee shall be in writing, signed by WDOE, or its designees, and the Trustee shall act and shall be fully protected in acting in accordance with such orders, requests, and instructions. The Trustee shall have the right to assume, in the absence of written notice to the contrary, that no event constituting a change or a termination of the authority of any person to act on behalf of the Grantor or WDOE hereunder has occurred. The Trustee shall have no duty to act in the absence of such orders, requests, and instructions from the Grantor and/or WDOE, except as provided for herein.

Section 15. Notice of Nonpayment. The Trustee shall notify the Grantor and WDOE, by certified mail within 10 days following the expiration of the 30-day period after the anniversary of the establishment of the Trust, if no payment is received from the Grantor during that period. After the pay-in period is completed, the Trustee shall not be required to send a notice of nonpayment.

Section 16. Amendment of Agreement. This Agreement may be amended by an instrument in writing executed by the Grantor, the Trustee, and WDOE, or by the Trustee and WDOE if the Grantor ceases to exist.

Section 17. Irrevocability and Termination. Subject to the right of the parties to amend this Agreement as provided in Section 16, this Trust shall be irrevocable and shall continue until terminated at the written agreement of the Grantor, the Trustee, and WDOE, or by the Trustee and WDOE, if the Grantor ceases to exist. Upon termination of the Trust, all remaining trust property, less final trust administration expenses, shall be delivered to the Grantor.

Section 18. Immunity and Indemnification. The Trustee shall not incur personal liability of any nature in connection with any act or omission, made in good faith, in the administration of this Trust, or in carrying out any directions by the Grantor or WDOE issued in accordance with this Agreement. The Trustee shall be indemnified and saved harmless by the Grantor or from the Trust Fund, or both, from and against any personal liability to which the Trustee may be subjected by reason of any act or conduct in its official capacity, including all expenses reasonably incurred in its defense in the event the Grantor fails to provide such defense.

Section 19. Choice of Law. This Agreement shall be administered, construed, and enforced according to the laws of the State of Washington.

Section 20. Interpretation. As used in this Agreement, words in the singular include the plural and words in the plural include the singular. The descriptive headings for each Section of this Agreement shall not affect the interpretation or the legal efficacy of this Agreement.

IN WITNESS WHEREOF the parties have caused this Agreement to be executed by their respective officers duly authorized and their corporate seals to be hereunto affixed and attested as of the date first above written. The parties below certify that the wording of this Agreement is, with the exception of changes required by the Washington State Department of Ecology to assure compliance with the financial requirements of WAC 173-303-400 and/or WAC 173-303-620(10), identical to the wording specified in 40 CFR 264.151(a)(1) as such regulations were constituted on the date first above written.

RHONE-POULENC INC.

PIERRE VALLA

Vice-President and

Chief Financial Officer

Attest:

John M. Iatesta

Assistant Secretary

Attest:

Title

Corporate Trust Officer

Seal

CONNECTICUT NATIONAL BANK

Title

STATE OF NEW JERSEY)
) ss:
COUNTY OF MIDDLESEX)

On this 23rd day of August 1988, before me personally came Pierre Valla to me known, who, being by me duly sworn, did depose and say that he is the Vice President and Chief Financial Officer of RHONE-POULENC INC., the corporation described in and which executed the above instrument; that he knows the seal of said corporation; that the seal affixed to such instrument is such corporate seal; that it was so affixed by order of the Board of Directors of said corporation, and that he signed his name thereto by like order.

Notary Public

JOSEPHINE PERRUCCI
NOTARY PUBLIC OF NEW JERSEY
My Commission Expires Oct. 18, 1990

SCHEDULE A

This Agreement demonstrates financial assurance for the following cost estimates for the following facility:

EPA/State
Identification
Number of Facility

Name of Facility

Address of Facility

Cost Estimate for Which Financial Assurance Being Demonstrated By this Agreement

WAD 009282302

Rhone-Poulenc Inc.

9229 East Marginal Way South Seattle, Washington 98108

Closure \$17,800

Post-

Closure -0-

Total \$17,800

SCHEDULE B

The Fund is established initially as consisting of the following property:

A Letter of Credit in the amount of --\$17,800 (seventeen thousand eight hundred dollars) as issued by Barclays Bank PLC, 75 Wall Street, New York, NY 10265 commencing July 20, 1988

EXHIBIT A

Pierre Valla Vice-President and Chief Financial Officer Rhone-Poulenc Inc. CN 5266 Princeton, New Jersey 08543-5266

Robert R. Briggs
Director or Health Safety
and Environmental Affairs
Rhone-Poulenc Inc.
CN 5266
Princeton, New Jersey 08543-5266

Miquelon L. Bragadir Treasurer Rhone-Poulenc Inc. CN 5266 Princeton, New Jersey 08543-5266



BARCLAYS BANK PLC 75 Wall Street New York, NY 10265

IRREVOCABLE LETTER OF CREDIT NO. .810766

THE DIRECTOR
Washington State Department of Ecology
Northeast Regional Office
4350 150th Avenue North East
Redmond, Washington 98052

Dear Sir or Madam:

We hereby establish our Irrevocable Standby Letter of Credit
No.810766 in your favor, at the request and for the account of
TRhone Poulenc, Inc., 9229 E. Marginal Way South, Seattle, Washington
98108 up to an aggregate amount of (United States Dollars Seventeen
Thousand Eight Hundred) U.S.\$17,800.00 available upon presentation
of:

- (1) your sight draft, bearing reference of this Letter of Credit No.810766 and
- (2) your signed statement reading as follows "I certify that the amount of the draft is payable pursuant to regulations issued under authority of the Resource Conservation and Recovery Act of 1976 as amended, and the Hazardous Waste Disposal Act as amended (Chapter 70.105 RCW)."

This letter of credit is effective as of July 20, 1988 and shall expire on July 20, 1989, but such expiration date shall be automatically extended for a period of 1 (one) year on July 20, 1989 and on each successive expiration date, unless, at least 120 (one hundred twenty) days before the current expiration date, we notify both you and Rhone Poulenc, Inc. by certified mail that we have detided not to extend this letter of credit beyond the current expiration date. In the event you are so notified, any unused portion of the credit shall be available upon presentation of your sight draft for 120 days after the date of receipt by both you and Rhone Poulenc, Inc. as shown on the signed return receipts.

Whenever this letter of credit is drawn on under and in compliance with the terms of this credit, we shall duly honor such draft upon presentation to us, and we shall deposit the amount of the draft directly into the standby trust fund of Rhone Poulenc, Inc. in accordance with your instructions.

We certify that the wording of this letter of credit is, with the exception of changes required by Washington State Department of Ecology to assure compliance with the financial requirements of WAC 173-303-400 and/or WAC 173-303-620(10), identical to the wordings specified in 40 CFR 264:151(d) as such regulations were constituted on the date shown immediately below.

This credit is subject to the most recent edition of the Uniform Customs and Practice for Documentary Credits published by the International Chamber of Commerce.

Very truly yours,

BARCLAYS BANK PLC

Pamela Seeley Authorized Signature

July 19, 1988

Nelson Bernardo Authorized Signature

July 19, 1988

APPENDIX E

LIABILITY INFORMATION

HAZARDOUS WASTE FACILITY CERTIFICATE OF LIABILITY INSURANCE

Name of Insurer, National Union Fire Insurance Company of Pittsburgh, Pa., of 70 Pine Street, New York, N.Y. 10270 hereby certifies that it has issued liability insurance covering bodily injury and property damage to Rhone-Poulenc Inc. (te "Insured"), of CN 5266 Princeton, New Jersey 08543 in connection with the insured obligation to demonstrate financial responsibility under 40 CFR 264.147 or 265.147. The coverage applies at:

Location

Liability Coverage

Sudden

Seattle, WA 9229 E. Marginal Way South Seattle, WA 98108 1,000,000/2,000,000

The limits of liability are \$3,000,000 each occurrence and \$6,000,000 annual aggregate exclusive of legal defense costs. The coverage is provided under policy number \underline{PRM} 7063060 issued on 8/18/87. The effective date of said policy is $\underline{8/18/87}$.

- 2. The Insurer further certifies the following with respect to the insurance described in Paragraph 1:
 - a) Bankruptcy or insolvency of the insured shall not relieve the Insurer of its obligations under the policy.
 - b) The Insurer is liable for the payment of amounts within any deductible applicable to the policy, with a right of reimbursement by the insured for any such payment made by the Insurer. This provision does not apply with respect to that amount of any decuctible for which coverage is demonstrated as specified in 40 CFR 264.147(f) or 265.147(f).
 - c) Whenever requested by a Regional Administrator of the U.S. Environmental Protection Agency (EPA), the Insurer agrees to furnish to the Regional Administrator a signed duplicate original of the policy and all endorsements.
 - d) Cancellation of the insurance, whether by the Insurer or the Insured, will be effective only upon written notice and only after the expiration of sixty (60) days after a copy of such written notice is received by the Regional Administrative(s) or the EPA Region(s) in which the facilities are located.

e) Any other termination of the insurance will be effective only upon notice and only after the expiration of thirty (30) days of such written notice is received by the Regional Administrator(s) of the EPA Region(s) in which the facilities are located.

I hereby certify that the wording of this instrument is identical to the wording specified in 40 CFR 264.151(j) as such regulation was constituted on the date first above written, and that the Insurer is licensed to transact the business of insurance or eligible to provide insurance as an excess or surplus lines insurer, in one or more States.

Signature of Authorized representative of Insurer

Joseph Secretary

APPENDIX F

FIELD SAMPLING PLAN

FIELD SAMPLING PLAN

INTRODUCTION

The purpose of the Field Sampling Plan (FSP) is to present a description of field activities; sampling equipment, locations and procedures; and chemical analyses for the closure of the drum storage area and waste tank at the Rhone-Poulenc plant in Seattle, Washington. The FSP is divided into three main sections. The first section addresses the sampling of concrete from the drum storage area and waste tank. The second section addresses the sampling of soil. The final section, titled Additional Field Procedures, presents procedures that apply to both the concrete sampling, and the soil sampling (e.g. sample handling and shipping, chain-of-custody, etc.), therefore eliminating the need to discuss these procedures in both sections.

CONCRETE SAMPLING

This section addresses the following:

- o Sampling of waste tank concrete pad and analysis for copper
- o Sampling of drum storage area concrete pad and analysis for methylene chloride

WASTE TANK CONCRETE PAD/COPPER

After the waste tank concrete pad has been steam cleaned it will be visually inspected for cracks. Three separate concrete samples will be taken from three separate cracks that are considered to be representative of the cracks in the concrete pad. The specific sampling locations will be determined in the field at the time of sampling. The concrete samples will be analyzed for copper.

The concrete samples will be obtained by drilling into the concrete with a 1/2-inch drill bit to a depth of approximately 1 inch. The drill bit will be centered over the crack prior to drilling. The powdered and chipped concrete generated during drilling will be collected and placed in 8-ounce glass jars. The drill bit and other sampling equipment will be cleaned prior to each sample collection in accordance with the decontamination procedures identified in the Additional Field Procedures. A summary of the sample locations, analyses, and sampling labeling, including quality control samples, are shown in Table F-1. The appropriate sample bottles, preservatives, and holding times are

Table F-1
STEAM CONDENSATE AND RINSE WATER SAMPLING

Sample	Location	Analysis	Sample I.D.	
Concrete	Waste tank concrete pad	Copper	RPS-CU-CP1	
Concrete	Waste tank concrete pad	Copper	RPS-CU-CP2	
Concrete	Waste tank concrete pad	Copper	RPS-CU-CP3	
Equipment Blank		Copper	RPS-CU-CP4	
Concrete	Waste tank concrete wall	Copper	RPS-CU-CW1	
Concrete	Waste tank concrete wall	Copper	RPS-CU-CW2	
Concrete	Waste tank concrete wall	Copper	RPS-CU-CW3	
Concrete	Waste tank concrete wall	Copper	RPS-CU-CW4	
Concrete	Waste tank concrete wall	Copper	RPS-CU-CW5	
Concrete	Drum storage area concrete pad	Methylene chloride	RPS-MC-CP5	

listed in Table F-2. All samples will be placed in iced coolers after the samples have been collected and labeled.

The samples will be labeled with the following identifiers:

- o RPS--Rhone-Poulenc Seattle
- o CU--Copper
- o CP_--Concrete Pad/Sample Number

For example: RPS-CU-CP2

Additional labeling procedures are discussed in the section titled Additional Field Procedures.

One equipment blank will be taken to assess possible contamination in the bottles or possible contamination originating from sample handling and shipping. The equipment blank will be collected by rinsing the equipment with reagent grade distilled water at the site and then filling one 500-ml polyethylene bottle with the water.

Chain-of-custody and sample handling and shipping procedures are discussed in the section titled Additional Field Procedures.

Background samples of the concrete will be obtained using the same drilling sampling procedures as for the concrete pad (it will not be necessary to sample at cracks since the samples are background samples). The background samples will be obtained from the outside surface of the waste tank concrete wall. A total of five background concrete samples will be taken and analyzed for copper. They will be collected from portions of the wall that have no apparent contamination based on visual observation. The background samples will be spaced apart from one another in order to obtain representative background samples. The specific sampling locations will be determined in the field at the time of sampling.

The samples will be labeled with the following identifiers:

- o RPS--Rhone-Poulenc Seattle
- o CU--Copper
- o CW --Concrete Wall/Sample Number

For example: RPS-CU-CW2

Additional labeling procedures are discussed in the section titled Additional Field Procedures.

The copper concentrations of the three concrete samples from the waste tank concrete pad will be compared to the copper concentrations of the background samples to determine whether

Table F-2 SAMPLE QUANTITIES, BOTTLES, AND PRESERVATIVES

Analysis	Containers	Minimum Sample Volume	Preservation	Holding Time
Water				
Copper	500-ml polyethy- lene bottle	500 ml, fill to shoulder	Add HNO ₃ to pH <2, cool to 4°C	6 months
Soil and Concrete				
Copper	8-oz glass jar	8 oz (soil) 50 gr (concrete)	Cool to 4°C	6 months
Methylene Chloride	40-ml glass vial	One 40-ml vial	Cool to 4°C	7 days

additional sampling at a greater depth in the concrete pad is necessary. A total of five background concrete samples will be obtained. The natural logarithm of the copper concentration in each sample will be calculated. The logarithmic values will be used to calculate the mean and standard deviation for the background samples.

Three concrete samples will be obtained from the waste tank concrete pad. The natural logarithm of the copper concentration in each sample will be calculated. The logarithmic value of the copper concentration in each concrete pad sample will be compared to the mean plus four standard deviations of the background samples. If the logarithmic value of the copper concentration in the concrete pad sample exceeds the background sample plus four standard deviations, then additional sampling at a greater depth in the concrete pad will be performed.

DRUM STORAGE AREA CONCRETE PAD/METHYLENE CHLORIDE

After the drum storage area concrete pad has been steam cleaned, it will be visually inspected for cracks. One concrete sample will be taken from a crack that is considered to be representative of the cracks in the concrete pad. The specific sampling location will be determined in the field at the time of sampling. The concrete sample will be analyzed for methylene chloride.

The concrete sample will be obtained using the same drilling sampling procedure as described for the waste tank concrete pad. The powdered concrete will be placed in a 40-ml glass vial. The vial will be placed in an iced cooler after the sample has been collected and labeled.

The sample will be labeled with the following identifiers;

- o RPS--Rhone-Poulenc Seattle
- o MC--Methylene Chloride
- o CP --Concrete Pad/Sample Number

For example: RPS-MC-CP2

Additional labeling, chain-of-custody, sample handling, and shipping procedures are discussed in the section titled Additional Field Procedures.

SOIL SAMPLING

This section addresses the following:

Soil sampling adjacent to waste tank

- o Soil sampling at abandoned sump
- o Background soil samples
- o Method for determining whether soil removal is necessary

SOIL SAMPLING ADJACENT TO WASTE TANK

Samples will be collected from 5 locations along the perimeter of the tank as shown in Figure F-1. The locations were selected to provide an indication if the material stored in the tank had been spilled to the surrounding soils. The soil samples will be collected within 5 feet of the concrete pad footing.

The soil samples will be collected using the following procedures:

- o The surface material (gravel and crushed rock) will be scraped to the side.
- o A hand-operated auger will be used to dig down to a depth of 1 foot.
- o A stainless steel spoon or trowel will then be used to scrape the sides of the hole to collect a composite sample from the surface to the 1-foot depth.
- o The material removed will be placed directly into the sample container for analysis of copper.
- o The boring will then be augered to a total depth of 2 feet.
- o A stainless steel spoon or trowel will then be used to scrape the sides of the hole to collect a composite sample from 1 foot to the total depth of 2 feet.
- o The material from the second depth interval will then be placed directly into a second sample container for analysis of copper.
- o The samples will be placed in iced coolers after they have been collected and labeled.
- o The remaining material will be placed back into the boring. The boring's location will be measured from an existing structure and logged in the field notebook.

Figure F-1

The sampling equipment will be cleaned prior to each sample collection in accordance with the decontamination procedures identified in the section titled Additional Field Procedures.

The samples will be labeled with the following identifiers:

- o RPS--Rhone-Poulenc Seattle
- o SB --Soil boring Number
- o Depth

For example:

RPS-SB3-0.0/1.0

Additional labeling procedures are discussed in the Additional Field Procedures. The appropriate sample bottles, preservatives, and holding time are listed in Table F-2. A summary of the boring numbers, depths, analyses, and sample labeling, including quality control samples, are shown in Table F-3.

The number of field duplicate samples and equipment blanks are shown in Table F-2. The equipment blanks will be prepared by pouring reagent grade distilled water over the stainless steel spoon or trowel and then pouring the water into the sampling container.

Chain-of-custody and sampling handling and shipping procedures are discussed in the Additional Field Procedures.

SOIL SAMPLING AT ABANDONED SUMP

Soil samples will be collected in the vicinity of the abandoned sump. The abandoned sump is located east of the existing sump and south of the drum storage area. The exact location of the abandoned sump will be determined from previous plant drawings prior to sampling.

Two to four soil borings will be drilled in the vicinity of the sump. If the location of the sump does not restrict the drilling of the borings, then four borings will be drilled on the four sides of the sump. If only two borings can be drilled because of site restrictions, the two borings will be drilled on the west side (river side) of the sump. The specific location of the borings will be determined at the time of sampling.

A concrete cutter will be retained to cut through the concrete pad. After the concrete is cut and removed, the soil samples will be collected using the following procedures:

o A hand-operated auger will be used to dig down to the groundwater/soil interface.

Table F-3
SOIL SAMPLING

		Sampling Depth		
	Sample	(ft)	<u>Analysis</u>	Sample I.D.
	SB-1	0-1, 1-2	Copper	RPS-SB1-depth
	SB-2	0-1, 1-2	Copper	RPS-SB2-depth
	SB-3	0-1, 1-2	Copper	RPS-SB3-depth
	SB-4	0-1, 1-2	Copper	RPS-SB4-depth
	SB-5	0-1, 1-2	Copper	RPS-SB5-depth
	SB-6	0.5 - 1.5	Copper	RPS-SB6-depth
	SB-7	0.5 - 1.5	Copper	RPS-SB7-depth
	SB-8	0.5 - 1.5	Copper	RPS-SB8-depth
	SB-9	0.5 - 1.5	Copper	RPS-SB9-depth
	SB-10	0.5 - 1.5	Copper	RPS-SB10-depth
	SB-11	Groundwater/Soil Interface	Copper	RPS-SB11-depth
	SB-12	Groundwater/Soil Interface	Copper	RPS-SB12-depth
_	SB-13	Groundwater/Soil Interface	Copper	RPS-SB13-depth
!	SB-14	Groundwater/Soil Interface	Copper	RPS-SB14-depth
U	Duplicate (SB-4)	0-1	Copper	RPS-SB50-depth
	Duplicate (SB-9)	0.5 - 1.5	Copper	RPS-SB51-depth
	Equipment Blank	Distilled Water	Copper	RPS-CU-CP6
	Equipment Blank	Distilled Water	Copper	RPS-CU-CP7

- o Soil will be collected from the auger at the groundwater/soil interface.
- o The soil removed will be placed directly into a sample container for analysis of copper.
- o The samples will be placed in iced coolers after they have been collected and labeled.
- o The remaining soil will be placed back into the boring. The boring's location will be measured from an existing structure and logged in the field notebook.

The sampling equipment will be cleaned prior to each sample collection in accordance with the decontamination procedures identified in the section titled Additional Field Procedures. The soil borings will be numbered 11 through 14 and will have the same label identifiers as the waste tank soil borings (except for the soil boring number). Chain-of-custody and sample handling and shipping procedures are discussed in the Additional Field Procedures.

BACKGROUND SOIL SAMPLES

Samples will be collected from five locations in the general vicinity shown on Figure F-2. The specific sampling locations will be determined in the field. Additional background soil samples may be collected for the purpose of comparison to the abandoned sump soil samples.

The soil samples will be collected using the following procedures:

- o The surface material will be scraped to the side.
- o A hand-operated auger will be used to dig down to a depth of 1.5 feet.
- o A stainless steel spoon or trowel will be used to scrape the sides of the hole to collect a composite sample from 0.5 feet to 1.5 feet.
- o The soil removed will be placed directly into a sample container for analysis of copper.
- o The samples will be placed in iced coolers after they have been collected and labeled.
- o The remaining soil will be placed back into the boring. The boring's location will be measured from an existing structure and logged in the field notebook.

Figure F-2

The sampling equipment will be cleaned prior to each sample collection in accordance with the decontamination procedures identified in the Additional Field Procedures.

The background soil borings will be numbered 6 through 10 and will have the same label identifiers as the waste tank soil borings (except for the soil boring number).

The appropriate sample bottles, preservatives and holding times are listed in Table F-2. A summary of the boring numbers, depths, analyses and sample labeling, including quality control samples, are shown in Table F-3. Equipment blanks will be prepared using the same procedure as for the waste tank soil borings. Chain-of-custody and sampling handling and shipping procedures are discussed in the Additional Field Procedures.

METHOD FOR DETERMINING WHETHER SOIL REMOVAL IS NECESSARY

Copper is naturally occurring in soils; it is expected to be found in a log normal distribution in soil. Therefore, the natural logarithm of each analytical value obtained will be used in calculation of the mean and standard deviation for comparison of the waste tank samples with the background soil samples.

A total of five background soil samples will be obtained (additional background soil samples may be collected for the purpose of comparison to the abandoned sump soil samples). The natural logarithm of the copper concentration in each sample will be calculated. The logarithmic values will be used to calculate the mean and standard deviation for the background samples.

Ten soil samples will be obtained from the vicinity of the waste tank. The natural logarithm of the copper concentration in each sample will be calculated. The logarithmic value of the copper concentration in each waste tank sample will be compared to the mean plus four standard deviations of the background samples. If the logarithmic value of the copper concentration in the waste tank sample exceeds the background sample mean plus four standard deviations, then soil will be resampled in the vicinity of the original waste tank sample or the soil will be removed in the vicinity of the original sample. The amount of soil that may need to be removed is dependent upon the analytical results and any additional sampling that is found to be necessary.

Two (or four) soil samples will be obtained from the vicinity of the abandoned sump and compared to the background soil samples in the same manner as described above. During sampling it may become apparent that the five planned background samples are not satisfactory background samples for

the purpose of comparison to the abandoned sump soil samples (e.g., the background soil samples are from a different stratum). If this is the case, additional background samples that would be more suitable for comparison purposes (e.g., from the same stratum) may be collected.

ADDITIONAL FIELD PROCEDURES

This section of the FSP addresses the following:

- o Sample handling and shipping procedures
- o Field documentation
- o Decontamination procedures

SAMPLE HANDLING AND SHIPPING

Sampling, handling and shipping procedures include:

- o Labels and sample identification
- o Packaging
- o Chain-of-custody forms
- o Shipping

Labels and Sample Identification

A label will be attached to each analytical sample bottle. The information to be included on the sample labels is:

- o Sample number
- o Initials of person collecting the sample
- o Date and time of sample collection
- o Type of preservative (if any)
- o Analyses to be conducted

Individual identification numbers will be placed on each sample container at the time of sample collection. Identification numbers are shown in Tables F-1 and F-3.

Packaging

Each analytical sample bottle will be placed in an individual zip-lock plastic bag, packed to prevent breakage, and placed in an iced cooler. One copy of the chain-of-custody record form will be placed in a sealed plastic bag taped to the inside of the cooler lid. The cooler lid will be sealed with fiber tape. Two chain-of-custody seals will be attached to the outside of the cooler so that the seals must be broken if the cooler is opened.

Chain-of-Custody Forms

Chain-of-custody forms will be used for all samples. Each time the sample bottles or samples change hands, both the sender and receiver will sign and date the chain-of-custody form and specify what has changed hands. When a sample

shipment is sent to the laboratory, two copies of the chainof-custody form will be retained; one will be kept in the project files and the other will be sent to the consultant project manager.

The following information is included on the chain-of-custody form:

- o Sample number
- o Signature of sampler
- o Date and time of collection
- o Place of collection
- o Number and type of container
- o Signature of receiver

In addition to the chain-of-custody form, other components of chain-of-custody control will include sample labels, field log book, sample receipt, sample shipment, and the laboratory log book.

SHIPPING

Soil and water samples will be delivered by overnight courier or hand delivered to the designated laboratory. A signed receipt from the shipper acknowledging receipt of the samples will be attached to the field coordinator's copy of the chainof-custody sheet.

FIELD DOCUMENTATION

A bound and numbered field logbook will be used to record all sampling and site information pertinent to the site investigation. All log book entries will be made with noneraseable ink. Any corrections will be made by striking out the incorrect entry with a single line such that the original entry is not obliterated. The person making the correction will also initial the crossed out entry. The correct entry will then be made below the crossed out entry.

DECONTAMINATION PROCEDURES

The objectives of decontamination are to prevent the introduction of contamination into samples from sampling equipment or other samples; to prevent contamination from leaving the sampling site by way of sampling equipment, personnel, drilling equipment or construction materials; and to prevent exposure of field personnel to contaminated materials. This discussion outlines procedures that will be followed to meet decontamination objectives.

Soaps and Detergents

TSP will be used as the detergent for cleaning all equipment and materials. Onsite tap water will be used with TSP for decontamination washing. Distilled water will be used for final rinsing of all equipment. Common soap and onsite tap water will be used for washing hands and face. Use of other products must be cleared with the CH2M HILL site manager before use.

Sampling Equipment

Decontamination procedures are designed to remove trace-level contaminants from sampling equipment to prevent cross-contamination of samples. This section describes the decontamination procedures to be used on sampling equipment.

Sampling equipment may include, but is not limited to:

- o Stainless steel knives, spatulas and mixing bowls
- o Stainless steel scoops, spoons and trowels
- o Hand cores and augers
- o Sampling dippers
- o Drill bit

Equipment used to collect samples for chemical analyses will be cleaned before field use and between each sample collection according to the following procedures.

- 1. TSP and tap water wash.
- 2. Tap water rinse.
- 3. Hexane.
- 4. Acid rinse (metals analysis only).
- 5. Distilled water rinse.
- 6. Methanol rinse.
- 7. Air dry.
- 8. Distilled water rinse.

The purpose of the first step, a TSP-and-water wash, is to remove all visible particulate matter and residual oils and grease. This is followed by a tap water rinse to remove the TSP and a hexane rinse to remove organics. An acid rinse, included if samples are to be analyzed for metals, provides a low pH medium for trace metals removal. It is followed by another distilled water rinse. Next, a methanol rinse is used to remove trace organics. After the methanol has been allowed to evaporate, the sampler is rinsed with distilled-deionized water. This rinse removes any traces of the methanol.

Hand cores and augers may be decontaminated by steam cleaning.



RHÔNE-POULENC INC.

SPECIALTY CHEMICALS DIVISION CN 7500, CRANBURY, NJ 08512-7500 TELEPHONE: (609) 395-8300 February 4, 1992 RECEIVED FEB 1 4 1992

DEPT. OF ECOLOGY

Mr. Byung K. Maeng, P.E. - Environmental Engineer Department of Ecology Northwest Regional Office 3190 160th Avenue S.E. Bellevue, Washington 98008-5452

Re: Independent Registered Professional Engineer's

Certification of Closure

RCRA Interim Status Facility - Seattle Plant

Dear Mr. Maeng:

It was a pleasure to meet you on the recent site inspection of Rhône-Poulenc's facility on East Marginal Way in Seattle. Edwin Liu and I are looking forward to working with you and Tom Post on this project.

During the site inspection you requested a copy of all documents used as support for the certification by the independent professional engineer that the closure of the interim status storage facility was closed in accordance with the closure plan approved by the Washington Department of Ecology. The certification is intended to satisfy the requirements of WAC 173-303-400(3)(a).

Attached please find a copy of all of the attachments used in support of the certification. Feel free to call me at (609) 395-3303 if you have any questions regarding this matter.

Sincerely,

Christian S. Berry

Environmental Manager

Mutai & Ben

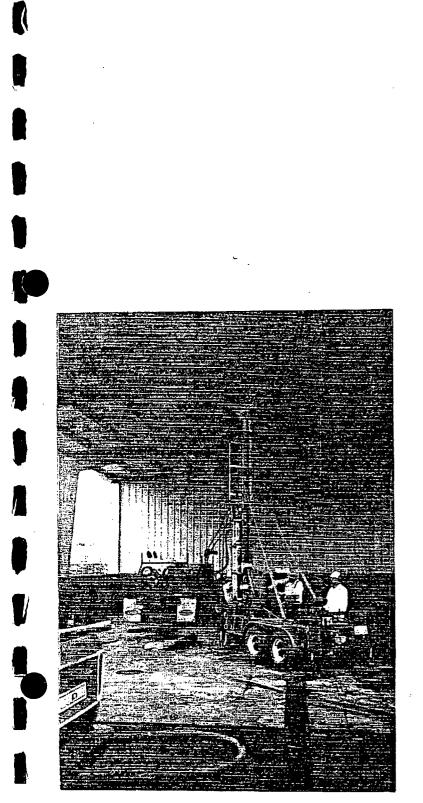
Att.

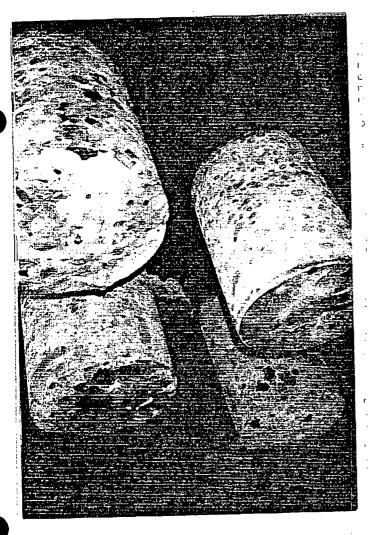
RHONE-POULENC, INC. CERTIFICATION OF CLOSURE-RCRA INTERIM STATUS STORAGE AREA-SEATTLE PLANT

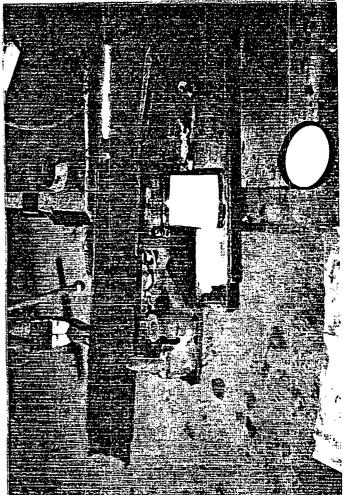
ATTACHMENTS WITH ACCOMPANYING DOCUMENTATION

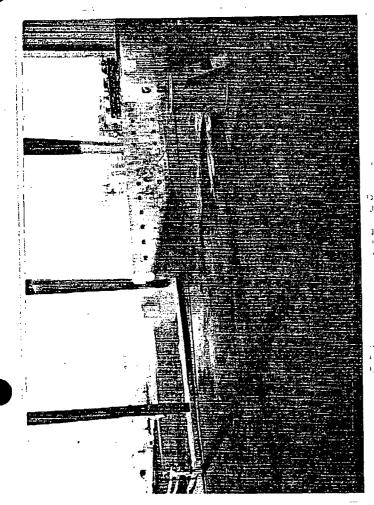
CH2M HILL JANUARY 1992

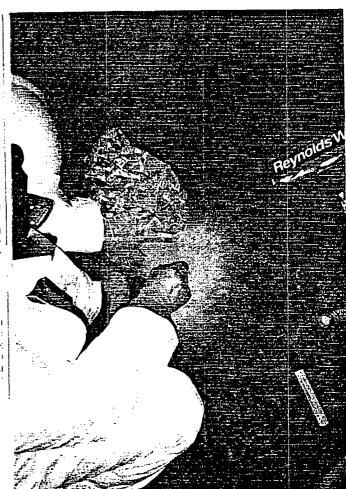
ATTACHMENT 1

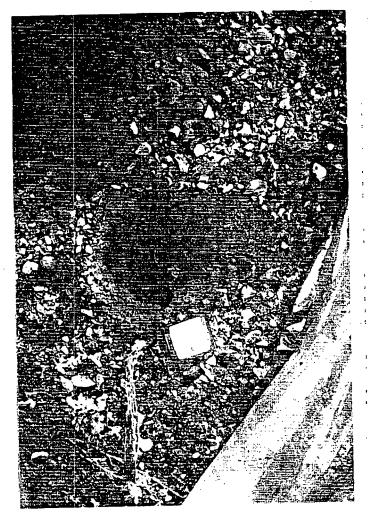






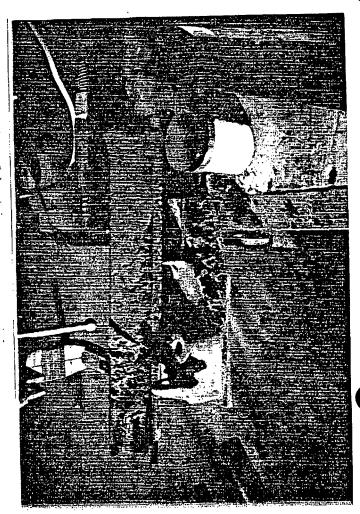


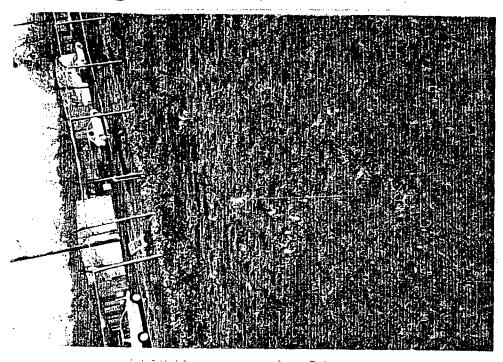


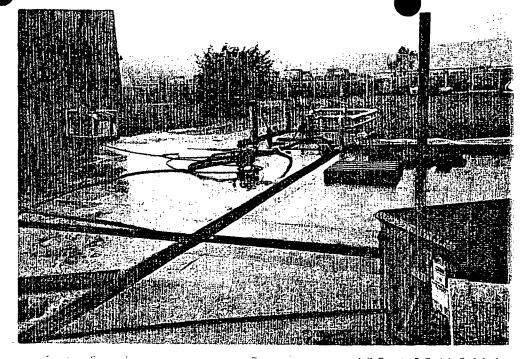


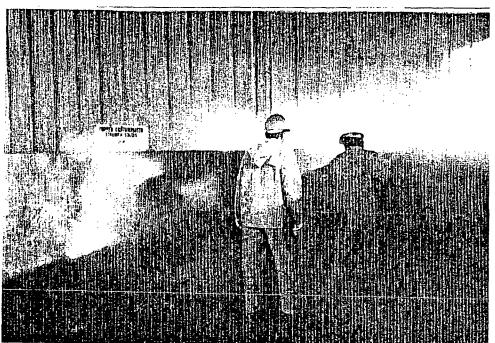


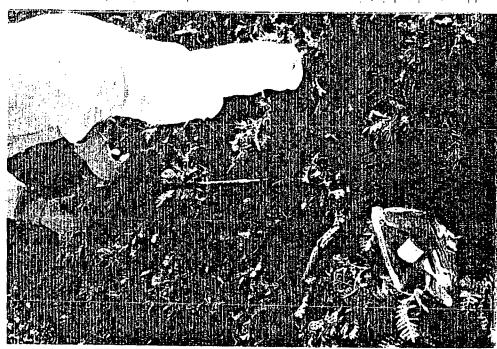


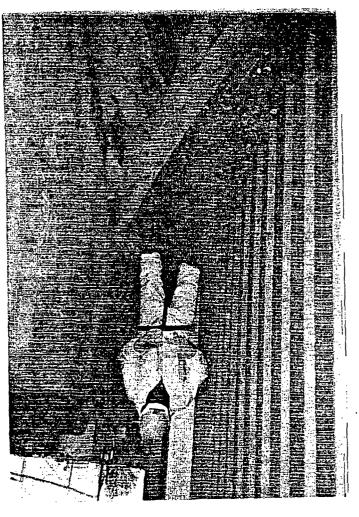


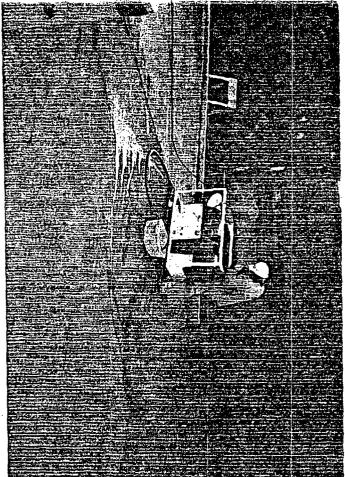


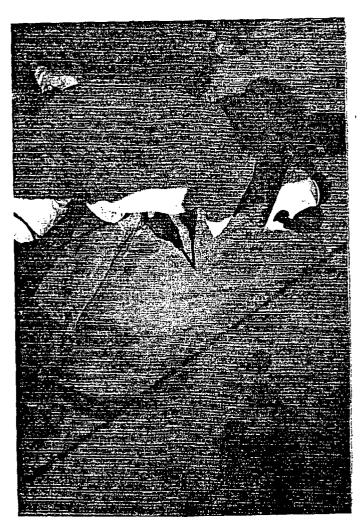


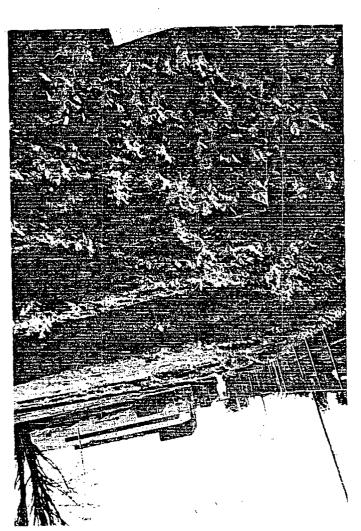


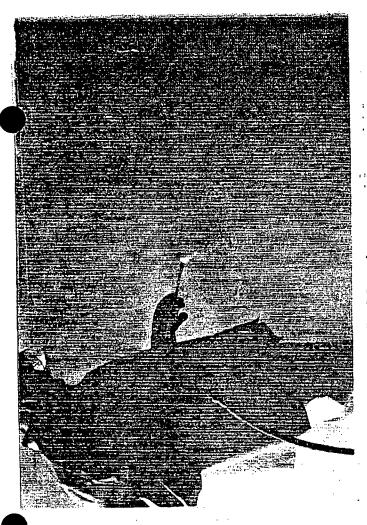


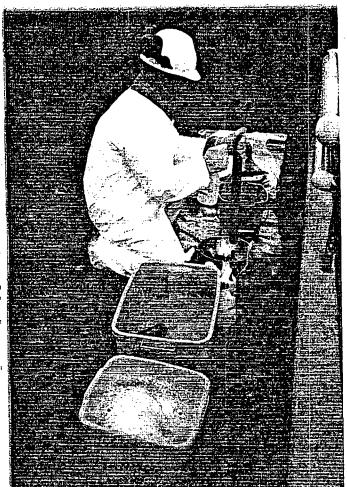




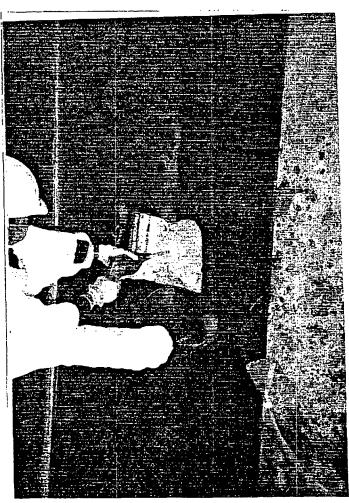








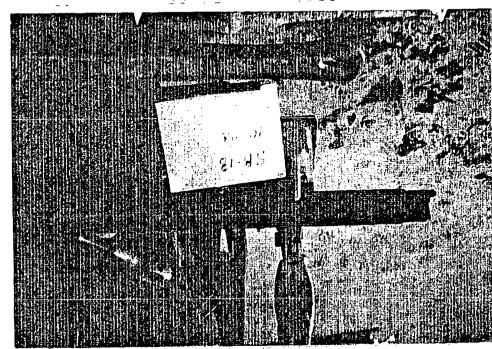












ATTACHMENT 2

Notebook No. ROJECT RHOUS POURSE RCRA Uncontinued From Page_ 0645-Eszesoch mont direct HAYS OF KHOUE KIN MECCALLIN JAMS MATT SEFEROUGH OF MIGARIET DELENG 0715 - GRANT - HAYS RIVISM SITE Any LOCATIONS FOR WALL TO AT BREAK REOM 2 RELICUI RIBNE 0730+ PLETTING PERSTE David Actions Take Presented of Par KEN & MATT WILL BELLES A 2000 16 Pass SPATON US. NO HOT HAD a A STERM CLIANTE KIN MAS DELISE STREM ON OUTSIDE OF BRUM STORES LISTELS TO BROWN Amt of H.D THAT GOLD OWNS ACASTIC STANT STAN COEAN BY STORAGE ARLA CONCRETE WALLS -AN ALLA COSE TO DEGRA mount of Aus works CAKED ON THE AND STOCK Ans 2420 Asnesso w/ HEATED Had Any Perso Nosses But There is OFFINITE STAN CAPT ON CONSTRUTE THIS STATEM CUSEU 0700-Stays Beings A RISCE OF EXPRISES MEINE DUT TO Per over segue PIPE THAT USADS TO Gent & Essexons BECAUSE OF CENTH OF MAKE INVOLED IN CLEARING PAD MAY STATE BACKESE PAD DIMENSCONS BROWNT AN OW MAP SKITH OF Scarest Continued on Page

Signed Super

11/28/29

Read and Understood By

Signed

Date

FUSE - HATE IS FRUNTED BY MASIC MOSTER FIT NOT SHARED TO SHARED TO SHARED TO SHARED TO SHARED THE CONTINUED TO SHARED THE CONTINUED THE SHARED TO SHARED THE CONTINUED THE SHARED TO SHARED THE CONTINUED THE SHARED THE SHA	DJE	C	Τ_																			-		Ca	ontin	ued f	mon ²	Page	·			-	
6: 19 5 Am well as the control of a control of the			-									,					01																
COD - An HALL Schol IS Dave Ancieno And Finnes And & Concept And AD Property of Any English on Concept Consider Consider And Angeles Charles on Any English on Concept Consider Consider Angeles Charles on Any English on Silver on Concept Consider Angeles And Carly on the Concept Lag Mark An Ho Silver on Construction Alare Say that Angeles on Silver Angeles Consider Angeles Angeles Angeles And Carly on the Concept Lag Mark An Ho Silver on Consider Angeles The Spirit Looks to the Fram the Internation Contoning And Angeles Angeles The Spirit Looks to the Fram the Internation Contoning And Angeles Angeles Consider Contoning Angeles Angeles of Spirit Angeles Sandward Contoning And Angeles on the Consider Consider Angeles The Consider Contoning Angeles on the Consider Consider Angeles The Angeles of Holys Says Mart Spirit Consider Consider Angeles The Angeles of Holys Says Mart Spirit Consider Angeles The Consider In Holys Says Mart Spirit Consider Angeles The Consider In Holys Says Mart Spirit Consider Angeles The Consider In Holys Says Mart Spirit Consider Angeles The Consider In Holys Says Mart Spirit Consider Angeles The Consider Consider Angeles Consider Angeles The Consider Angeles Spirit Angeles The Contoning On Property Angele	<u> </u>	1	5†		4/1	k_	15	PRO	m	10	<u> </u>	112	0		100	u	PI	$-\nu$	<u> </u>	56	Rig	#	u	3	15		CA	us	A13	<u> </u>	70		
Reserved on Any Resource and converte concrete on Trended Season 3 Acadesisando Reserved Reser			_	_{	2.1	PM	10	6	95	5/	m	es:	7 1	∞	4 _M	U	on	uz	a	2_			_		_	-				 		 	
Reserved on Any Resource and converte concrete on Trended Season 3 Acadesisando Reserved Reser			_		_	_	 -	<u> </u>		<u> </u>	ļ			<u> </u>	<u> </u>	<u> </u>	ļ	 	 	 			<u> </u>	 	<u> </u>		_	<u> </u>			\sqcup	$\vdash \dashv$	
Reporting OLD HAPT & CARLY CAUSE ON SHOW ON CONCESSES - ENTREE THE GOTTE STRANDS SUCCESS ARE REST ON THE CONCESSE AS THE ARE NO SHOWS ON CONSTRUCTORING HAPE & SAYS THAT CANCEL STALL ACTION (FAR) BUS GOT SPELLY, THE CONTROLLATION, HAPE & SAYS THAT CANCEL STALL ACTION (FAR) BUS GOT SPELLY, THE CONTROLLATION, HAPE & THE STALL LOOKS TO SE FROM THE CONTROLL CONTROLLED AND HELP FOUR CONTROLLED AND SET AS A CONTROLLED AS THE CONTROL OF SET AS A SHOWN OF THE CONTROL FOR THE STALL CONTROLLED AS A CONTROLLED A	10	200	0		An	H	يال ا	Sc	كمه	45	00	202	A	200	وسا	4	34	- 5	m	96 E	A	19	=	Con	Z34	12	Pa	<u> </u>	10c				
GO HAS & GART CONTROL ON STRUM ON CONCRETE - QUINCE PAR. GOTHE STRUTUTE SOLIDS. ARE KINT ON THE CONCRETE BAS THEN ARE NO STRUM ON CONTROL CONTROL HAS SAY KINT CHANGE AND THE AREA NO STRUM ON THE CONTROL HAS SAY KINT CHANGE AND PRICE OF STRUME AND THE CONTROL HAS AND STRUKE AND THE AND THE CONTROL PARTY THEN AND THE CONTROL PARTY THE CONTROL PARTY THE CONTROL PARTY THE BAS AND THE CONTROL PARTY THE BAS AND THE CONTROL PARTY THE CONTROL PART		L			P64,	5	سه	4	4 /	en	ous	2 0	<u> </u>	2.00	24.5	2	cu	2	EC.	or	72	معط	#	As	220	1	34	qu	ca	-	10		
Act 1617 De Policiere 1825 Aller Act Ho Enthus On Christic Construction, Holis SAVE THAT CHANCES STORE BOTTOM (FAR) Bus Get Shows Are is Scored Accump on the same Review of the Control Control Traffice in second Burs Accump The stand locals to se from the chances of Control And Arthur Fore Car se same avei. 1080 - After Lumpston of Wast Associate Of Control Stand Arthur Fore Car se same avei. 1080 - After Lumpston of Wast Associates of Control Stand Arthur Fore Car se same course Control Arthur Controls Act Accurses A Stand on the Control Red Same wife Control Arthur Act Accurses A Stand on the Control Red Control Arthur Controls Act Accurses A Stand on the Control Red Control Arthur Controls Act Accurses A Stand on the Control Red Control Arthur Controls Act Accurses A Stand on the Control Red And to Same and Control Red Stand Control of the Control		L			RS	100	بخفا		<u> </u>		<u> </u>		<u></u>					_			<u>_</u>				ļ								
Act 1617 De Policiere 1825 Aller Act Ho Enthus On Christic Construction, Holis SAVE THAT CHANCES STORE BOTTOM (FAR) Bus Get Shows Are is Scored Accump on the same Review of the Control Control Traffice in second Burs Accump The stand locals to se from the chances of Control And Arthur Fore Car se same avei. 1080 - After Lumpston of Wast Associate Of Control Stand Arthur Fore Car se same avei. 1080 - After Lumpston of Wast Associates of Control Stand Arthur Fore Car se same course Control Arthur Controls Act Accurses A Stand on the Control Red Same wife Control Arthur Act Accurses A Stand on the Control Red Control Arthur Controls Act Accurses A Stand on the Control Red Control Arthur Controls Act Accurses A Stand on the Control Red Control Arthur Controls Act Accurses A Stand on the Control Red And to Same and Control Red Stand Control of the Control						Ŀ	Ľ				<u> </u>	<u> </u>			<u> </u>				ļ		_		<u> </u>				<u> </u>						
Act 1617 De 10th Conceste 1825, Aller Act the strains are closing consequent from 1815 SAVE THAT CLANCE CONTROL STRUCK (FAR) Buts Get Shows Are as a formal According to the flower are a flower of the control of the c				,		<u> </u>				<u> </u>	<u> </u>																						
Act 1617 De Policiere 1825 Aller Act Ho Enthus On Christic Construction, Holis SAVE THAT CHANCES STORE BOTTOM (FAR) Bus Get Shows Are is Scored Accump on the same Review of the Control Control Traffice in second Burs Accump The stand locals to se from the chances of Control And Arthur Fore Car se same avei. 1080 - After Lumpston of Wast Associate Of Control Stand Arthur Fore Car se same avei. 1080 - After Lumpston of Wast Associates of Control Stand Arthur Fore Car se same course Control Arthur Controls Act Accurses A Stand on the Control Red Same wife Control Arthur Act Accurses A Stand on the Control Red Control Arthur Controls Act Accurses A Stand on the Control Red Control Arthur Controls Act Accurses A Stand on the Control Red Control Arthur Controls Act Accurses A Stand on the Control Red And to Same and Control Red Stand Control of the Control	10	10	,	H	415	r	6	920	7	إسط	se	معن	57	سا	on	(رےمد	213		1	UHE	ec	PHE		رصرحا	esc	51	K41	w 2:	, 5	FOL	103	
SAYS MAST CANCERS STREET BOTTOM (TAK) BASE SAY SHOWN MASS AND STREET STREET CONTROL AND AND AND AND AND AND AND AND AND AND	-		1		}	Т.	1	1	1	L	T -	1	1	_		1	Γ	1	· ·		Ŧ		1	1	1	T		T :	1	1			
Access on the gare Privil orse Anath Norman Propose times mound our gard of the Tox of the second of						Г	Ι			T -	_		1	i	7		Г	I	Г				Ĭ	Ι] _		1						
The stand coast to St. From the extreme or Continues and there for Courte st. shapers avel. 1080 - NAUT Conversion of Word Administration of Encourts to Site of St. Have to assert Convers and Armitist of Convers from the Red Sandware Continues and Accuses A Stem on the Convers to Court of Convers to the Property of the Convers to the Convers to the Convers of the Convers to the Convers to the Convers to the Convers to the Convers to the Sandar to the Convers to the Sandar to the Convers to th			7		1	1	1	1 .	1			1	1	ì		1	i .	y	ì	1	i	1	1 1	1	1		1	Ĭ :	1)]		
1080 - DAVE LUNOSMOM OF WOOS ASOMOND OFFICE US ESCORES TO CITE OF SY HAVE TO OBSERVE CHANNE ARTHURIUS OF CONTRACT STOMART RAD SAMELLE (CONTROLS ARE DECUSED). A SEAM IN THE CONTRACT DOWN MYDAY OF COMMENT FOR DAY INTERSETS DAYN SYSTEM WOULD OF A GOOD CHORDON. THERE ARE NO STANDARD CASES ON THE CONTRACT IT IS I'T CONOCITY OF SY REGAR. TO RECUSED IT HAYS SHIP THEY (R) KNOW IT WAS CONG TO SE FOR HAPP. WHAT STOMARS AND THEREFOR WAS GUEST U STOWED. HAYS CLUMOSTOM USANT. CONTRACT STONARY PAD 1150 - KNOW HAY AMEN OUT OF LEGISLAY FOR STAM COSAUTE AND WILLDS TO GET MORE 1100 - FORME EMMA BRITES A STAME RANT FIRE PRINT FOR MY MORE TO PERFORM THE CONTINUED ON CONTINUED STAME. 1200 - FORME EMMA BRITES A STAME RANT FIRE PRINT FOR MY MORE TOWER THAN IT WOULD BE CONTINUED ON CONTINUED ON CONTINUED STAME. FOR LAWREN. 1200 - FORME EMMA BRITES A STAME RANT FIRE PRINT FOR MY MORE TOWER THAN IT WOULD BE CONTINUED ON CONTINUED ON CONTINUED ON PAGE 1200 - FORME EMMA BRITES A STAME RANT FIRE PRINT FOR MY MORE TOWER THAN IT WOULD BE SEEN FOR LAWRENCE TO STAME PRINT FOR MY MORE TOWER THAN IT WOULD BE SEEN FOR LAWRENCE TOWER PRINTS FOR MY MY MY MY MY MY MY MY MY MY MY MY MY	-	\vdash	7		1				I		T		I — —]		I	Γ.	1	Ī -	I	I	1	1	ī	1	T :					
1030 - BAJE Cumostrom of WOOS Represents of Escorets to SITE and ST Haves TO OBSIGHT CUSTOMINES OF Conveners STON ARE RECO. SAMELIAN COMPANY AND PRESENTS DEAD SYSTEM WOULD BE A GOOD CONGRED. THERE ARE NO SAMETHAS CHARLES OF THE CONCENTS OF A SOME CONGRED. THERE ARE NO SAMETHAS SHIP THEY (RP) KNOW IT WAS CONG TO SE FOR HAP WAST. STONESS ON THE FORM WAS SHOWN OF THE STONESS OF TH		\vdash	7				<u>~</u>	2006	7		12_	-		7.5	- 6	77	1	~	00	7100	3	777	1	770		542	٢	<u> </u>	32	34	200		
Have to observe Congress of Arments of Converse For Age Red Signalization (Control Age Accurates A Seam on the Converse Community of Converse And Their interests death system would be a Good Congress Three Ask to Signature Congress in the Congress of a Good Congress Three Ask to Signature of their stricters in the Congress of a Good Congress Three The Accurate Age three of the Congress of t			+		02	-	-	-		\vdash	-	-			-		-	-	 	-	-	-	-	-	-	-		-	\vdash	-	-		
Have to observe Congress of Arments of Converse For Age Red Signalization (Control Age Accurates A Seam on the Converse Community of Converse And Their interests death system would be a Good Congress Three Ask to Signature Congress in the Congress of a Good Congress Three Ask to Signature of their stricters in the Congress of a Good Congress Three The Accurate Age three of the Congress of t		-	+		-	-	-	╁	╁╌	-	├─	-	-	-		┝		-	╁┈	-	_		├─	 		├	-	 	 	-	-		-
Have to observe Congress of Arments of Converse For Age Red Signalization (Control Age Accurates A Seam on the Converse Community of Converse And Their interests death system would be a Good Congress Three Ask to Signature Congress in the Congress of a Good Congress Three Ask to Signature of their stricters in the Congress of a Good Congress Three The Accurate Age three of the Congress of t			<u>.</u>		├	<u></u>	_	[├		_			_	\vdash	-	\vdash	 _			-		-	_	├—	├	├	22		 		
SAMELINE COMMONS ALL ACCUSED A SERVE IN THE CONTROL DE CONTROL MANAGE DE CONTROL PART INTERIORS DE ACOUSTIC DOUBLE DE ACOUSTIC DE STRUCTURE DE ACUTATION DE ACOUSTIC DE ACOUST		u	2) 	0	l	1	1	1	1	1		l		i	l	l	1	ĺ	! _	ı		ł	l l	1	1	۱	1	72	-7	<u></u>	27		
CONCERT. FOR DAY INTERSECTS DEAN SYSTEM WOULD BE A GOOD COCKRION. THERE ARE NO STRUCTURE CONTROL CONTROL CONTROL OF THE CONTROL OF STRUCTURE OF REGAR. TO RECONSTRUCT IT HAYS SATS MARY THEN (RP) KNEW IT WAS GOOD TO BE FOR HAY? WASTE STONAGE AND INTERSECT WAS GUEST U STRONG. I HAYS - LANDSTROM DISCUSS OTHER HAY CORNER ON SITE. 1050 - LANDSTROM CHANT. CONTROL STONAGE, PAD 1150 - KEW HAY AWA OUT OF LEGISLAY. FOR STAM COSAWA AND NEWS ID GEST MORE 1700 - FRANK CAMB BRITES A STAME RAWT FIRE PRINT FOR MI, NO FOURT AND 17100 - GRANG STANDS PRINT FOR CLARATE 17100 - GRANG STANDS PRINT FOR CLARATE 17100 - GRANG STANDS PRINT FOR CLARATE 17100 - GRANG STANDS PRINT FOR CLARATE 17100 - GRANG STANDS PRINT FOR CLARATE 17100 - GRANG STANDS PRINT CLARATE 17100 - GRANG STANDS PRINT FOR CLARATE 17100 - GRANG STANDS PRINT CLARATE 17100 - GRANG STANDS PRINT FOR CLARATE PRINT FOR CLARATE PRINT FOR CLARATE PRINT FOR CLARA		┞	4		Н	كمك	R	0	3564	n	CLI	ىدە	ع کیدر	-1	en	25	us	OF2	C	we	u	<u> </u>	5/20	1.40	2	ROC	-	├	 	├	-		
ARE 16 SALVESTAL CASELS CO PHE CONCERT UT IS 1'T CONCRETE W/ 5" REGAL BORGONGORE IT HAYS SAIS MAT TAKER (RP) KNEW IT WAS GOING TO 32 FOR HAYE WASTE STORAGE AND THERETON WAS SALVET U STRONG 1445 - LUNDSTROM DISCUSS OTHER HAY CONSTRON SET. 1050 - LUNDSTROM LANT CONSISTS STORAGE PAD 1150 - KIN HAS ALL OUT OF LEGISLEX FOR STAM COSANIC AND VILLS TO GENERAL 1300 - FRANK EMMA BANSTS A SSATU PLANT FILE PRINT FOR USING 170 FOR THOSE 1210 - BANG ESSISOND BEING FOR CLUMB 1210 - BANG ESSISOND BEING FOR CLUMB 1300 - BENER ESSISOND RETURN FROM CLUMB 1300 - BENER ESSISOND RETURN FROM CLUMB 1418 85	_		4		5	has	u	4	Ca	477		1	12	as	cus	12	_ <u> </u>	5	4	لدع	יינו	2 6	محط	eec	-	000	<u>~</u>	1	420	25	ءَو		
TO REINSTANCE IS HAY'S SAIS MATE TAKEN (RP) KNEW IT WAS GONG TO SE FOR HAPP WASTE STONAGE AND THEREFORE WAS BULLET U STONAGE HAY'S & CUMPSTROOM RESCUES OTHER HAPP WASTE ON SOFT. 1050 - CLIMPSTROOM CHAPT. COMPANIE STONAGE RAD 1150 - KEN HAS RUM OUT OF KNUSSIN FOR STEAM CESANIE AND NEWS ID GET MORE 1700 - FORME EMMA BRISTS A SCATTL RANT FILE PRINT FOR LESS AND POWER PROPERTY ON CONTINUED ON CONTINUED BURGE FOR CLIMPS 1700 - BRANT EBSENSOND BEINGE FOR CLIMPS 1710 - BRANT EBSENSOND BEINGE FOR CLIMPS Read and Understood By Read and Understood By		_	_		2	200	175	B	2	24	7	725	225	ur	5 0	es	<u>د با</u>	cus	77-	10	Du	وب	180	4	6	000	<u>ن</u>	20	20	ے۔	77.	cec	
1050 - Lundstrom Crown Conserve Storger Rap 1150 - Lundstrom Crown of Legislar For Storger Rap 1700 - Frank Compa Britis A Scarre Rant Fire Print For using Power pool on Conserve Storger Rap 1700 - Grand Compa Britis A Scarre Rant Fire Print For using Power pool on Conserve Storger Rap 1700 - Grand Edward Ram France Compa		_	_		A	1_	16	52	4672	4	- 0	13	E45	(~	F.	K_	Con	en	42	ı	7	15	1	1	6~	ou	-	<u> </u> 22/	<u> </u>	5-"	RE	BA	~_
1050 - Lunsspam Lager Consider Stonger Rap 1150 - KEN HAZ RUN OUT OF LEGISLEY FOR STRAM CESANER AND VIEWS BO GET MORE 11200 - Frank Emma Bantos A Stater Rant Fire Print For is, no 12000 poor poor 1200 - Bant Eschool Beaux For Cincia 1300 - Bant Eschool Beaux For Cincia 1300 - Bant Eschool Beaux For Cincia 1300 - Bant Eschool Beaux For Cincia 1300 - Bant Eschool Beaux For Cincia 1300 - Bant Eschool Beaux For Cincia 1300 - Bant Eschool Beaux For Cincia		L	\perp		78	RE	بعد	nec	1£		HA	15	SAT	5_1	1.47	7.	KN	R	ر (ط	k ~!	س	15	u	98 (<u>So.</u>	26	70	3	2/	Far	H	92	
1050 - Lunsspam Lager Consider Stonger Rap 1150 - KEN HAZ RUN OUT OF LEGISLEY FOR STRAM CESANER AND VIEWS BO GET MORE 11200 - Frank Emma Bantos A Stater Rant Fire Print For is, no 12000 poor poor 1200 - Bant Eschool Beaux For Cincia 1300 - Bant Eschool Beaux For Cincia 1300 - Bant Eschool Beaux For Cincia 1300 - Bant Eschool Beaux For Cincia 1300 - Bant Eschool Beaux For Cincia 1300 - Bant Eschool Beaux For Cincia 1300 - Bant Eschool Beaux For Cincia			\perp		دير	451	2	Ton.	461	A	NO	Dis	22.6	ou	حرج	95	Bu	w	U	Sī	no.	JG.											
1050 - Lunsspan Lant Consert Storage RAD 1150 - KG HAR Run Cut of Keesen For STAM COSANE AND WESS BO GET MORE 11200 - FRANK EMMA BRISTS A SEATE RANT FIRE PRINT FOR 4, NO 12002 ROL 1210 - Brank Esseson Berge For Luncas 1300 - Brank Esseson Berge For Luncas 1300 - Brank Esseson Kenny Fren Cutth 1128 85					14	245	e,	lus	105	ra	1 6	isci	45	on	52	Ha	26	245	130	7	Ser								<u></u>				
1700 - Frank Cama Britis A Scarce Rower Fire Print For a not 1200 - Frank Cama Britis A Scarce Rower Fire Print For a not 1200 - Brank British British Cambo Briga For Cama British Continued on Page 1700 - Brank Edward Republished By Read and Understood By																						[.		[
1700 - Frank Cama Britis A Scarce Rower Fire Print For a not 1200 - Frank Cama Britis A Scarce Rower Fire Print For a not 1200 - Brank British British Cambo Briga For Cama British Continued on Page 1700 - Brank Edward Republished By Read and Understood By			10	52) -	L	200	17346	m C	Tav	P.	Con	RM	ne	SR	20	· .	Pal	5														
1700 - Frank Euma Bants A State Rowr Fire Print For as not it is a state for Linear Fire Print For as not it is serious being for Linear Francisco Bernar Francisco Bernar Francisco Bernar Francisco Bernar Francisco Bernar Francisco By Read and Understood By											ŀ																						
1700 - Frank Euma Bants A State Rowr Fire Print For as not it is a state for Linear Fire Print For as not it is serious being for Linear Francisco Bernar Francisco Bernar Francisco Bernar Francisco Bernar Francisco Bernar Francisco By Read and Understood By			16	50	_	41.	<i>, , ,</i>	2 /	نسا	A.	200	100	2016	ж.	5		53	2~~	0			1	2	NE	5	£ 1		20					
1210 Gran Esseson Bergy For Guner Continued on Page Continued on Page Read and Understood By	_	۲	٦				1	7			101	13.	7.7		1		7/2			77~	2.00	17-		<u> </u>		_							
1210 Gran Esseson Bergy For Guner Continued on Page Continued on Page Read and Understood By			,	A ~		E.		1			0	1					0			-	_	0.				 		2					
1210 - Brane Escricoro Berga For Caresas 1380 - Brane Escricoro Asono Franciación Continued on Page Read and Understood By		 '	1	עט			Γ	\Box				1 .		3	291	4	742	~		- (A	<u> </u>	32	147	-	-	EAS!	-50	1	200	- 7	000		-
13 80 - Bran Erzerson Kenn Fren Gurth Continued on Page Read and Understood By Ul 28 (85)			+	-	-	<u> </u>	نعوا	C28	16	\$ 2	na		W1)		-	 -		-	-	 	-	-	-	\vdash	 	\vdash	-	 	\vdash	-	╁╌┤		<u> </u>
13 80 - Bran Erzerson Kenn Fren Gurth Continued on Page Read and Understood By Ul 28 (85)		 	+		-	 	+-	+-	 	+-	 	-		-	 -	-	-	 	\vdash		\vdash	-	-	-	-	\vdash	-	├—	 	-	ا	\vdash	_
13 80 - Brand Ersensons Resons From Curette Continued on Page Read and Understood By Ulas Raman Li 28 (85)		⊬′	4	0-	-	10	-	15	مريخ	sou	?	Bu	su.	Fo	16	عبيا	4	_	 	\vdash	-	 		-	-	├	-	 	 	—	 	\vdash	<u> </u>
Read and Understood By Li 28 85	, 	-	+		<u> </u>	-	├-	₩	 	-	 	_	<u> </u>					-	 			-	<u> </u>	-	 	1—	-	 	<u> </u>	<u> </u>	\vdash		
Read and Understood By Li 28 [8]		17	3 ¢	<u> </u>	B	4	<u> ₹</u>	34	son	<u>برا</u>	kr	سم	Fre	h 1	w	11						_	_	1_	_	<u> </u>		<u> </u>	<u>ل</u> نــ				
Cluber & Sunt 28 (89		Ŀ	1				<u> </u>	<u></u>	<u> </u>		<u> </u>	L	<u> </u>		L		<u>L</u> _		<u> </u>	<u> </u>	<u> </u>		<u></u>			<u> </u>	<u> </u>	Con	itinue	ed on	Page	e 	
Signed Date Signed Date					./			A					ed	28	189			ſ	Read	and (Unde	rsto	od By	,									
		U	~~	~	Sig	ned					•			Da	te		-	-					Sign	ed				_				Date	

Notebook No.__ PROJECT Continued From Page_ Byfore da AT THIS POINT OF LOSES CIAZ MAE MAN COZONE HAD TO CALL CONERER CLASERS PE SCHEDUCING. MK BACK Grano Soil SAMPUS WHICE WEEK IS Constructe Sistance PAO HARDAUGHS WILL BE STAM CESQUES PRONTO USE FOIL PSCONTAMINATION AFTER Aubins were strangerson They were Our .4 distrance AH O Ruse Aus 1500 or 170 KGO Sec SANGLAR La @ AND HELD The year it from of MAIN PLANT -SEE MAP BECOM MAREMAL WAY UTIGITT 68' 8 ‡ N 1251 @ 576+579 AR 95' hosion From From Moranza Com Lication Comments 5 5 of utaity Pau 9,5 wof Aunter Fine RPS-50-6 + 05 - 1.5' SANCES MEEU AGOOD RPS-5B-7-05-1.5 1 Sankert Reacon APS-58-8 85 of stands in 154 751-05-15 DUPEOA Continued on Page Read and Understood By

.....

																				ľ	lote	boo	kΝ	0								
ECT		-,-		<u> </u>																•		Co	ntini	ued F	rom	Page	·—-			-		٠
110			G	- T	0	5.00	کند	5	6 22	vS.	<i>A</i>	صر	Au	622	5	Fe	2	7	***	R	run	4	ر ا	ع	511	L	S	27	٥6	₹ ा		-
	1	_																											OB		<u>.,</u>	
					, ,	•						_ [i i	1 .								1				KA		$\neg \tau$	
	7		GL				Τ.						_		1	T				ŀ									Au		_	
	T	_													Γ														e)co		\neg	
	+	1	-												L .		4		i								ı	1	م د			
	\dagger		1		1	1	1		ı		1				1		•		I	1	vz.											<u></u>
	7			•	F				رود		ايحاد		-11-		<u> </u>									تحر		<u>.</u> ۲		٠				
64	₹		•	po	- C	u-	Ci	6	_	50	5 4	מפ	· ·	7/	21.0	بعد	5	240	215	-	AL	2		Ļγ	R	ه. م	<i>/</i> -	0	1 2			
	7			l .	1	ı.	1	1	ı.	l	l		•	i	i		1	l		l .	4	ľ	1	ł .				1	775	ı — ı		
	†								-							1					1				.,_	-			7			
	†		-		1	-	 —	\vdash							 	1											1					
<u></u> 7α	5	-	Fin	541	M	26	2157	5 0	2	DA	.,	75	77.	C -		1/1	y C	1	رى	مرا	2	1		6	امه	-	45	7		\Box		_
	†		_	I			4	2/2		1		20	703		Ĭ-	1	7 3	-				_	_	<u> </u>		_	113					
	1				1/		Г					~		200		59	C5/	= 2	201		U	ص										Г
	1				7												T	_	Π.		12					_						
-	1		بر مرک			Γ		Γ		Γ		Γ	_		Т	1	1		$\overline{}$		T		,	<	Siz	م		0	ء تر		اب ا	
	1	ا	000	1	1		je .	- 4		ı	1	į.		1	1	1	1	i	1	1	11		1		-		1	-				<u> </u>
	1		712			T	1 -	0	_	T		1	1	1	\mathbf{r}			- 6-	-								 	<u> </u>	\vdash			
	1			.	$\overline{}$	Т	T -	Fre						Ι.	Γ	T -	 			-				-			 	 	\vdash			H
)†	-		,	T	Ι	1	Gi			1	1			1			u				 		l				 	┢			\vdash
	†			7		Τ.	Ι.	QL.	i -	_	I	T	1	T	لك	1		,														\vdash
	+			-	I	Γ	1 -	c			1		1	1	1	C.		0 7		ши	1	5		EAR	۸		1	44	ļ —			\vdash
**	1			2	1		1								1	Į	ı	I	1	1			$\overline{}$	$\overline{}$				1	CP	2	av.	┢
•	1				 			Hz		\	-	17.	7 %		1						1/-0	···	-		1/						\Box	┢
	+		-			 	<u> </u>	l CVZ	7	1-					-	 			┢		T	 		-				1	\vdash			
70	7			11	-	E	دره	u	4, 2	<	, 12		 		-	İ		\vdash		 			 				†-		\vdash			┢
	7			-14	7					ور					 	\vdash		١,							_			\vdash				┢
 2^	_		G.		رمہ	6	2.0	\$20	16		5	-			1			П				T		\vdash			1					
					 		, v				77.	12			†-			П	\vdash			H	115	10	 	-	\vdash	\vdash	\vdash	_	<u> </u>	\vdash
	7				T	<u> </u>	-	<u> </u>	十一			1	_		1	1	MSE	H				1	CIE	معر	h .		 	 	\vdash		<u> </u>	
	7					1	\top			1		-		-	10	معن	45	H	*	 		#	100	14	U		\vdash	\vdash	<u> </u>		_	T
7	-†		\vdash	-			\vdash	-	 	\vdash	 		Ť	1	+	T	 	\sqcap	-	\dagger		-	V.	1	//		╁	111	A	229	220	L
	+		-	-		-	\vdash	+	\vdash	\vdash	\vdash	-	-	\vdash	+-	-	-	H	-	\vdash	-	-		1			+	4	1-	128	-	+
—	+			-	-	\vdash	\vdash		\vdash	\dagger	\vdash	-	 	\vdash	+-	\vdash	\vdash	$\dagger \exists$	\vdash	-		17	1//		M		+		<u> </u>		-	T
•	+		T	-	 	t^-	†	1		\vdash	 	\vdash		T	 	 	\vdash	1	\vdash	\vdash	 	1/	1/	1	111		+	\vdash	_		\vdash	T
	+			-	\vdash	-		-		\vdash	\vdash			 	+-	\vdash	†	 ^	+	 -		024				Cor	ntinu	ed or	n Pag		L—	<u></u>
j)		7		Ц	<u></u>		<u> </u>	٠	1	<u></u>	ــــــــــــــــــــــــــــــــــــــ	ــــــــــــــــــــــــــــــــــــــ	1	1	1	<u></u>	<u> </u>		<u> </u>	<u>. </u>	KTB:	ne C	<u> </u>	<u> </u>							
	Ł			7		Ž	₩.				11	128	k K				Read	and	Unde	ersto	od By	′										
1	_=	v	Sig	ned	<u> </u>		-		-	_		Da	to		_	-					Sign	ed								Date		

Notebook No.____ **PROJECT** Continued From Page ___ 0700+ Acure onsuz MCGUZZT Bruckes ALL SIGNIAS DE COOL - 450 MATT SIGHTS STAPE CURPOSING HATS CASUT KMCCLAPHUM BEFORE NICOLU. NO NEED & KALL Correction 72 094 BUT COESAS T KU BALL Moon # 4615 GPO STRAM CCIANTEL (WHITEO LUI. See # 889 - 2005 BENS 575Am Residence was Hors 622 4262 0745- HN- CAUSERD TO 62 MM W/ 100 MM 1505 WELL & 6. 85'512N - HARED MCDEL PI-101 SER 10 0900-اسرماء يحر ANTONER 5Ban ccap 40006 Process 571900 STORAGE Pick L p visu curre A 2000 PSI desper 50-1 RPS-581-10-11 Collect BG Hiller Mer Courses c 531-0-1' 15 METU 28' From MW Com PAD ROYERY IN THE CENTER Continued on Page Read and Understood By

																					N	lote	boc	k N	o			_				
PR	JJE	CT_					<u></u>														•		Co	ntin	ued f	rom	Page	e			-	
					Π																											Γ
5	13	25		232	453	20	HA	0	130	500	27	ر د	14		×4	/50	بر بر	AN	2	nas	in	< 4	rze	2	015	دعه	52/	, 2	تعدد	دود	2012	(
				\Box	T	I	Т —	Γ	r	i	T	⊢ 7⁻			1	Ī				Ī			Γ.	_			i —			יאכד		
			1	٢	1	سكاد ا	Ţ	Į.	Į.	1	Ţ	Γ			1	Γ			Ţ	•	Ţ		Ţ				Ţ-			245	-	
			_			1	I		Π.		· ·	I –	1	1	1	Γ			Ī	T -			l		1	ΙΞ.	Γ^{-}		T	×.		
					$\overline{}$	Ī			$\overline{}$	T	1 -	Γ	Γ						$\Gamma = \Gamma$	Ι. Τ			Г		Г				T	S		r
	13	45	1		۱_	1	1	1.	6,3	ł	Ι,	1	i	ł .	i			ŀ	1	l l	1		1	1	i	ł	1	Pize	1			Γ
			-	1	ł	1	r .	1 1	i	1	1 .	~	1	1	ì	1	L)	1	1	1	7	1		1	1	1	1	1 '	40	w	Γ
				I			Τ.	F	46		1 -				1	1		1	T				1			I — —	T		T _	1.5		7
				1	J.,	₹																										Γ
					T .																				يم ر		24					Γ
	1	1/5	-	1	20	5-	53	2 .	10	-1	7		51	m	22	7	66	J	_	11	2.6	137	-		7	1 -	1 -	200		2/2	0.	
	<u> </u>	<u> </u>	-		ALL	T	Τ		40						T	T		\Box	Г	1			1"				T	7		44 2		۲
	,	420	_		1 -			T -	1.8		T	Γ			T				T			I				I	T	T^{-}	1-	24	-	D.
-		<u> </u>						Ι	Ú		T -	₽	1	i —	1	Г	ì	i		ı		i -	Ι-	L	1			1	Г	2	Ι	Г
					1		T		_	1	T	I^{-}		,	Т	Γ		Γ	I			I			Γ			Γ	Γ	u		Г
			-	ł.	058	Į.	۱ ـ	1	130	1	1	1	1	1	١.	1	1	1	Į.	L	1	· /	25	١.	, "	1			7	- 4		7
		 	 	-		*	-			777	72	<u> </u>	~	ىن			-		2_0			4	-	-	4		 	<u> </u>				H
		 			\dagger		 	-	_			-			 	 	-			 	<u> </u>	 	 		 			 	 	-	┢	H
	7	ии	K	2	25	<	3 2	.7,	D-1	, ,	۲.	- <	An	12	,	41-	نده	-	1	Ca	74		No	50						2	رمط	
	Ť	•							en		·		ነ .	3	1	sec	1	1	1	1	ì	1	1	1	coc	ì	ì	1	ì	Co	1	1
		45	2	-	RP	5-	513	3-	(0	.7	- 1.	6)			T 7	الاود				Г	, — —		-			72	1	<u> </u>		Co	234	r
					<u> </u>		2			ř	 ''				7	70 2	_	-		<u> </u>	70	1 2 3		_	_	-	 	\vdash	 			t
		150	00	_	10	2-2	1	55	2.2	~	643	7	<u>د</u>	20	Pn	355	(43	a	ve	L-	E	. 5.2	, ,	52	4.	14	7	\vdash	\vdash			T
		152	T	τ	$\overline{}$	T	T	T	5-1	1	63.	Y	1	ì	1	ì)	75.			-				12	12.7	<u>۲</u>	 	·	 	 	T
			~	-		1.1	1	ı	CF	1	-	${}^{-}$	1 4	(59	1	1	6		00		1.	Fo	_	111		4	tea.	5-		k
		 	<u> </u>	\vdash	 \		-			-			7/	7/	12	(A)			2		7.73	Ketr	<i></i>	150		A	NO	572	7 2	So	-	f
		 		И	-	0	114	51	OFA(6.4	MA		1451	Vr :	A.K	CH	DA.	ns.	SA	. 0.		1/2	cst	25~	 	_	 	_	\vdash	 	\vdash	T
		-	1	/ '-		-		-		100		Ė	,	14	-				3.1						S			\vdash			 	T
	_	 	-											<u> </u>	1								_		-		 	\vdash	一			r
		t^-		_	T	Г	7	u	1	1	-	-	\vdash	T	t	1	-	t				\vdash	\vdash	\vdash	 			\vdash	 	\vdash	\vdash	t
•		\vdash	_		11		- 5	("		H	_	_		 	 	1	 	 	 	 						Т	\vdash		 		\vdash	ţ.
		-		_	††	- 39	₹	 	\vdash	#		-		<u> </u>	-		\vdash		-	-	-	\vdash	_	-			\vdash	<u> </u>	-			t
-			U SA	7	4	 	 		 	儿		 	-		 	-			-	 	 	\vdash	-	 	-		\vdash	†	<u> </u>		-	t
		14	111	5 14	* 	 			t	#	1	1415	WAH	V 01	put	17,4	Hit	H	 				-	<u> </u>	 	\vdash	İ	 	 	 	\vdash	t
		 ''		 	1011	þ		\vdash	\vdash	1,0	ja.	_		-	-		-				_		 	\vdash			\vdash	 	 	-		T
					W a	- V		\vdash		(DV	u				-	-							 	 -		-	Cor	L	ed or	Page	•	
ľ		<u>.</u>	<u> </u>				L	—	<u></u>	<u> </u>	L	<u> </u>		-	<u></u>	<u> </u>	<u> </u>	<u>-</u>			· .	ـــ ــ	<u> </u>	L	<u> </u>					<u>_</u>		_
-		In	1	1	N	d						ul	i	1,			•	beer	and (unde	rstoc	xa By	,					•				
	i	!!!	Ħ.	16	у,	9	1					ul	24 /	1, 5					`													

Date

Signed

Signed

Charles R Sant
Signed

11/25/95 Date Read and Understood By

Signed

Date

																				N	lote	poo	k N	o							
RO	ήEC	Τ				<u>·</u>																Co	ntin	ued i	-rom	Page	·			-	
	Co	72	ñe	n A	9																										_
		1	ifB	i i	i 1		20	ھر	_	SA	ec.	موتر	A	18	PH	1	מסן	ge.	An	a	Des	7	\ \ 2	60	2	rs .	38	0.	Eas	<u>v</u> -	
	_7	An	1	! ?}_0		نب	HI	د	OA	v	u	ا ديميا	251.	ا جمع	20	-	<u> </u>	70 E		5750	7	25	172		12	رے	200	4	اندر	22	,
<u> </u>		غرد_	SA	-Pu	کائد)	Le	41) ~	3_	n	M	ے د	153	u	A	4,	₽.	BE		<i>ـ اما</i> ي	_ ک	A	a	2	ic	12	174	<u>محد</u>	р Е		
		من 5	AGE	A	uq		A	FR	r 9	<u> </u>	_	451	E172	56	11	u	243	0	يمت	458	2	P	200		2/3	_	50	ً ر	Q۷	20.	n
₽_↓	- 1		Con	1	1		ľ		: 1		i	1	1	1	1	1		l			1 1					1		1 1	4 !	1 I	
_	4	440	<u> </u>	352	عم	Co	الميا	Ju.	عد	Hic	<u> </u>	F	مرها	<u> 5</u>	es l	10	20	<u>څ</u>	Cu	50	2000	sz.	50	Zes;	-	A	12	"_	18		
	i		10-	1	!	i l		i	i (i	I	1	I		Γ	1			i	i	ГΙ				T-	I	Ί :	(i	i i	1 [-
		1	EUA	1	Ι .			i		_		1		1	T	Ī	F -								T	I				1 -1	ين
		_ :	218	i	ī.	i — '	T	pr.	بهد	/x	500	255	A	04	Cus	- //	ייטפ	، ئ	صح	אמ	2	m	-	ترد	Si	29	2/ <i>[</i>	25	ESW	==	
-		cuq	عديد	T		T 1							-		-	-	-				_			-		-	├─	<u> </u>	-	\vdash	-
	-		Ī) Hi		ı i	í l	I		Ì	į	i	ł	1	I —		1		I	I							1	1	1		<u> </u>
•		ī	7 9	i	MA	41	34	4	U	43	ce	40	Ru.	A)A	25	- 2.	> /	15.	con	779	un	457	77.0	26-	124	<u>z</u> :	500	2005	20	وكمة	<u> </u>
	-		522						ac	M		├		-					_		-	<u> </u>		-	-		\vdash	 	-		-
			<u> </u>	<i>U.</i> -	<u>101</u>	m	70	r_						-	 		!	-	-	_				-		-	-	<u> </u>	-		_
			+	-								-	ar F	- A	-				ก	75	0.1	164	4-4-4		4		Ps.	. a			_
	7	TH		 							. 5	BYLA		1				-	Ĭ.		1				i	1	T]	Ars	4
	7	ft	1						/~/	p	<u>م</u> ن أ	 		†					١ ـ ،	ł	ł	1	Ť	1	1	ſ	1	L I	l	45	i
	- 	Ť	 	1	11	77	[//	1/6	1					1						Ĭ	Ŧ		I				T			OP	
		1		Co	1166	STA	معاش	1		<u> </u>									Γ		Ĭ		1	T -	ĺ	1	T	[["	- 4	
	1					Ass			A	1	ROU	66												Ĩ .	1	$\overline{}$	48				
		" 1.1	PALLE		hoy			X		5	100	3)																			
		سلامى	<u>\</u>	Ž,			1	بمرين	2		V ?																				
					1/	11		2			_											_		_	_	$oldsymbol{ol}}}}}}}}}}}}}}}}}}$		<u> -</u>	<u> </u>		_
	1	23	المتامد		4/	//		No.	5			<u> </u>	<u> </u>	<u> </u>	_	_			<u> </u>	<u> </u>	_		ļ	_	_	<u> </u>	<u> </u>	<u> </u>	igspace		L
┸	<u>ar</u> A	100	الم	-		11				_	<u> </u>	<u> </u>	ļ	↓_	-	_	-	_	-	<u> </u>	 	ļ_	_	_	_	↓_	 	 	igspace		Ļ.
d	100.		\perp	1//			4		i	_	_	-		1	1	0.00	الم تعديد	<u>.</u>	<u> </u>	<u> </u>	ļ	-	_	_	╀	╀	↓_	ـــ	├—	 	<u> </u>
	\rightarrow	_	-		WH.		/// HJH	4		***	+++		-		2571	1	-	602		-	 	-		-	\vdash	┼	+	├	╄	├—	-
■├ ─┼	}-		+	#	8	Buck	5		1		_	-	-	1		1	<u> </u>	-	 		-	├-	 	-	-	—	┼	├-	┼		-
	_			1/-	 	#	1		-	_	_	-	-	╂—	}-	-	-	-	╀	-	 	-	├_	 		╁	┼	┼	\vdash	-	-
	+		-	-	54		40	:	‡∤	_			\vdash	-	┼	-	1	<u> </u>	 	-	-	┼	├-	-	-	┼	+	┼	\vdash	-	├
⋝ ├─┤		_	+	 	<u>ا</u>				₹}	_	_	-	╁╌	╂—	-	-	-		-	 -	┼—		├	╁	╁	┼─	+	╫	┼─	├—	-
╺┞┤	\dashv	-	-	ر ا	7	-	\parallel					-	-	\vdash	┼	╁	┼-	-	<u> </u>	-	╁	-	-	╁	+	\vdash	┼─	 	 	\vdash	-
		-	+-	4	-	-		777		-	_		_	+	-	100		 	-	┼-	╁—	├-	-	+	╁┈	+	┼	 	╁╌	+-	-
	\dashv	+	+-	-	3816 .	MAL	4	معرا	loss.	17.	1/2	4.0	KW	77	1100	1417		\vdash	-	-	+	├-	-	-	-		ntinu	ed or	<u>l</u> n Pac	<u> </u>	<u></u>
		ــــــــــــــــــــــــــــــــــــــ	<u>.i.</u>	<u></u>			L	L	L	1	<u> </u>	<u> </u>	J	Ц	Ц_	l	<u>-</u>	!	<u> </u>	1	<u> </u>	<u> </u>	L	<u>. </u>	<u> </u>						_
	.	M	/		' ()		/				_	/		/			Read	and	Unde \	ersto	od By	,									
	_6	Lin	lent	12	2		_			_	14	21	12	39	_			•	1:								,		<u> </u>		
.	_		Sig	ned							•	Da	te								Sign	ed								Date	,

ÞΕ	CT_																	-				Co	ntini	ued F	rom	Page						
5 4	•				-			_										_											_		-	
4	0	-	6	ı	i .	l .	1		1	l 1				i	1	l		C	14	مد	حد	1	~	2 2	SPE	KA	-100	14	F			_
			9	\$	5/3	? -	53	4	_5	576	54	seg.	212	5	1/2	15	5	A	32.												_	_
Н				 	ļ		<u> </u>	-	-							-															$-\downarrow$	
<u>'</u>					ļ	<u> </u>	<u> </u>	<u> </u>	L	_	,			<u> </u>				<u> </u>													\perp	
Ц	ÉE	u	25	2	Lea	- per	ery	2	25	U	12	/8	5_																			
								<u> </u>		L.																						
	1	57	190	10	159	مري	1	Pr	C 21	1575	2 م	10	w		95	M		NA	M	سرر	, S	nu	1	0/7	24	5	702		دود		Ī	
П			i	1 -	1	I	7	1	l .			_		ĺ	m	1		I	1 .		ુ	1 1		l i	1	1 :	i	سا	i i	i T		_
) ⁻	513	1																											
			3.	7/3	-																										_	_
H	1		na C	-			2			\vdash				10	_	-		 						4 -				 	,,			_
		-		i	Ĺ	I	í	1	1	ĺ	ŀ	1	1	Ī	[1		1	ا ا	i i	مع		1	1	i e	l l		17 1	720			
Н			1	255	×10	12 9	2	3/	4	- /	res	<u> </u>	73	0	Kąz	80	1	7	ح	ع د	H-9	75	-	22	~?	2	Es	5 -	205			
<u>' </u>			<u> </u>	 	 	ļ								ļ	<u> </u>				_							_		-	<u> </u>			_
\dashv		R	~7	2	PA	555	111	ں ا	5798	44		31	52.5	B	معاد	J.	ىيى	1		602	9	es	Az.	es.		42	R	75	oc			
			4	ses	n	بجمع	5	100	0	Go	Z	me		1/	20	1/2	للاظ	é	2	Al	FBN	- 20	u	nes	Fu	-82			<u> </u>			
							<u> </u>					İ													-						.	
	1	G	pri						Hor	وموره	, ,	16	F	22	54	25.7	, 5	4.	مور	ريء	7	بربر چ	ar	27	ج-	K2	403	الدو				
				1	مكت	-	134		1			1			7	1		I			111				-	Ī —	[.		I			_
			T _		T	T	1		1			T		1	l	l .	İ	1	i		Bur			i	1			,,,,				_
				-		- 1.70	1	¥ 347	,				212	1	7			-	-	7	~	ودع	7	72	250			-	 			
. T			_	-					_		2	-			-			-	_	Con	CAC	172							-			_
H		د	500	1			25									$\overline{}$					cac											
-			1	ı	1	1	1	1	ł		i -	i	i .	[ı	i .		1	l		3)		1		ī	1	1	i .	, ,		
\vdash	_		12	31	- 4	H	1	1	1			ł		ı	<u>.</u>	l		i i		i I	0		i	1 1		1	1	- 1	FIC	د		
Ц			14	T	Su	2	<u>kur</u>	ووم	771	7	(O)	es	至八		90	<u> </u>	54	2/3	23	4	32	<u> </u>	772	11	E	فتو	<u>S.</u>	-	_			
			44	ړې	13	00	> د	كحرو	5.7	20	u	4	SA	UYS	15							<u> </u>										_
Ш							<u> </u>											<u>. </u>														l L
'	-	A	150	ربر	50	٤ ٥	circ	or.	105	5	ga	PC	£5	Pn	06.	15	50	50	024	روے	4	2		23	نب	2	60	278	لمعت	72		
ıŢ				ı	1	1	ł	ı	1 -	ı	i	l			l .	1		1	l i	i i	Bo	1		1 -		1	I	1				
\sqcap			A	مريا	i	Ī	3	Ι.	9	I	İ			i	١.	1	- 1								- · - •		736		1			
				ru.		I	I		Ι.	l				Ī		7		~	_	<u> </u>					 - -		 			\vdash		
H	•			_	3/	V	Per	7 -		73		~	773		مک		- 22	7	<u> </u>	-		 	-	-			-	 	-			
" 		1	 	-	\vdash	1	 - -	 	-	_	_			<u> </u>	_	-					-	_	_	10	—		\vdash	 	 			_
	_	<i>[2</i>		24	I	Τ	Z	$\overline{}$	7			Ι.		1	92	T	12.	7	B -	35	5	731	رسر					N		20	_	-
\sqcup			1/4	10	מט	pu.	برمعا	5 73.	9	2	Fu	Eu	ــــــــــــــــــــــــــــــــــــــ	Cu	500	22	K	10	44	-	42	73	-	2/5	×	يمس	ec	Ka	12			-
_			13	3	-	360	245	7	34	C	147	130	J.	/ H	22	5/	10	تدما	051	20	4 <		<u> </u>	<u> </u>	 	<u> </u>	<u> </u>	<u> </u>	ļ			<u> </u>
\sqcup			<u> </u>	<u> </u>			<u> </u>	<u> </u>		<u> </u>	<u> </u>	_	_			Ľ	_		ļ	L			<u> </u>			1		<u> </u>	<u> </u>	لـــا		L
					<u> </u>		<u> </u>							<u> </u>				·		<u> </u>		<u> </u>				Cor	ntinu	ed or	Pag	e		
		/	A	·	l	/					/	,	6	•		ı	Read	and	Unde	rstoc	od By	,										
<u>//</u>	M	lo	14.	ركنه	do	ny					14/1	4/	07	<u>'</u>	_																	
ĺ			Sig	ned							•	Da	le							:	Signe	ed								Date		

. .

. .

ROJ	ECI	· 「 <u></u>																			- N	lote				rom	Page				-	
	4/	مع	2/2	39		0	۲,			62	لمبح		Ang	2 7	727	0	10	مري د	_عزا	_	۽ کرم	112		0	'Ci	202	re	U	R	2	LA	-
		\downarrow		_/	3	68	5250	m							رتزا																	
				AL	254	104	ے	ورز	273	_						_								-								L
	<u> </u>	_	N	40	rif	w	L H	475	4	Gn	7	-		192	A	י פיז	UH	130	بہ	Qi.	مدن	144	2_	192	7	10	سوب	D	4	<u> </u>		L
			_	Su	0	uA	on	بحدو	- 0	كبه	32	٤	· ·	رمدر	2.3	216		0.0	un	2	ne		20	00	25	4	u	Ac	2	9-	_	L
				مر	25/2	5. /	ر	Seo	25		As	17	5,29	ومد	تىر	يع	w	in	513	9201	a	2		-2	, 0	ے ب	<u>و</u> ج	12	ع	يتما		
				un	10	un	~74,	G.E	رج	30	، ۱	v	ىندكا	Q	LA	2.	-	Ps	SPA	22	G	25 4	Pres	بعتجازيا	ر م	Per	oi	iji	75. 1	R		
				1		l		_		1		ŀ	i	_	چر ې				ľ	1	1	ŀ	۱ ـ ۱	b	1	t			<u> </u>			
		- [1			١.			[]	1		i			Sa.		i	i	1				i .	ŀ	1		. 1	5 6	796	0		
					اما	ł		1	1	ĺ		1	l	ì	i	İ	1	1	1		i i	1		J	l	i	ŀ		J	و رب	مع	J.
							1	ا ما	i	l			I	Ι	1Z		Ī	T		I –			•				Ī			1 :	200	-
							آمره			Į.																		·				
0	80	20	1	74	066	41 6	ELZA	ہ، د	6-	15		ه د	مد	v	45	ce:	, -	n	221	us	50	me	6	ne:		A	معور	,	Sis	con	wa	u
						1	ì	1	ì	ì	ì	ì	ì	ì	ì	ľ	j	ì	1	Ì	1	ì	ì	ì	i	1	1	١.	1	سم		
1	1	\dashv	1				i	1	ı	l	1	l	i	i		ŀ	1	i	i	1	1		1	i	ĺ	۱	l	١,	1	250	l	
	1	1				I	i	į		i		i -	Ī	Γ	es	I	L.	Γ	Ŧ _	<u> </u>		1.7.7				1.2.	-	• -				
	1	7		,,,,,	221								((/)		-	7	3					1			_				İ			
1_	0	83	0	-	TVs.		Cada		R	p./	۷.	~/.	14	20.		,/	Can	-2		_	15	بديا	,	مده		. =	7	A#	201	OR		
+	Ť				l	l	i	Ì	i	1_	[i	1	l '	ري <i>ن</i> ت ده	'	i i	1	i	I	İ	I	I	Ī	1 _ `	1	T .		I			_
+	\top	1	-			T		Γ	\Box	Ĭ	1	1	T	Γ.	551		Γ -		ĭ	I		1		T	Γ	T	Ţ .	T	Ι —	Sø	135	
+		+			۔ ا	1	1		ŀ	Ι.	٠. ا	1_	١ ـ	J	i	l	1	l	L	1	سا		I _	١.	1			•	-		_	
+	+	\dashv		100		7		122	12		<u> </u>				7.4.4	1		7 6			<u> </u>	-1/-							ऻ			
6	20		_	No		0.	م				ne.			1/2	a"		4	יפט	~2		-			1.	2		20			ice	_	
+	1	7				L	1	i	7	1	5 ()			1	1						3			П							,	<u> </u>
+-	\dagger	+				775	100	36 _	-	777		a	W 2		2-5	~~		N 20.	CHO	_	* oc	12		724	325	0			_	\vdash	_	
+-	\dagger	┪			-		 	 		 				\vdash	\vdash		\vdash	\vdash	\vdash		\vdash		_									
0	72			٠٨		<u></u>		1				<u> </u>	11	2.6	1	0		ريم ا					4-1-	<u> </u>	2	12	6	_		رعم	\vdash	
+	1						Ι΄.		I '	1	I	1	T .			i		I	Ι	I -		T		1	T		T		1 -			
+	+	\dashv		Τ.	en	I	Т				Г			T	احد		\Box		Ī		Τ.									46	\vdash	
╁	+	\dashv		Har	1	7 1	(Ken	17	פע	3/	RK	11	14	-	100	GH a	PYS	13.7	250		7077	1	7/2	7	0.2	7,~	Τ			ومره		
╁	+			17	وعس	a.	Cr	97	}_	or	15	<i>175×</i>	20	<u>بر</u>	7/4	12	rue	1	***	<u>7_7</u>	0/ <u>£</u>	Te.	- 2	72.00	<u> </u>	-	200	54	9	c a	3.	_
+					 	0		-	0		-		\vdash	╁─			-	├	-		-	 	-	 _		 	}	-	\vdash			-
+0	7	19	_	1	_	1	-/	Ī	T	<u> </u>	1	12	res	-	BY	سع	14	de	4 6	AL	24.8	200	<u> </u>	PAG	ب	AA.	15	<u> </u>	<u>nus</u>	* a	<u> </u>	_
	╁	\dashv		w	w	1	<u> </u>	PA	0 .	├-	-	\vdash	-	├	 	-	-	├	\vdash	\vdash	╁	├			┼─	-	<u> </u>		1) Page	<u> </u>	<u> </u>
1_				<u> </u>	<u> </u>	<u></u>	1	1		<u></u>	L	<u></u>		<u></u>	<u> </u>			<u> </u>	<u> </u>	<u> </u>	<u>L</u>	<u> </u>	<u> </u>	<u> </u>		<u> </u>		unu	eu or			
		И		<i>[]</i> .	1	G	4_					11	130	100	,		ł	Read	and	Unde	rsto	od By	,									

Date

Signed

Date

Signed

Netudouk No.

1445	- RPS-	C4-,C0	٠١ - ١٠	BACK GRO	my Co	vers	war	- 59mp	is Mas	(N)	_ ~
	- THE DA	LILL BIT	- ulons c	Bicaun	nou AF	rsu o	ricins	61"0	عادم مرعع	e HAS A	9
	A			: 1		_		_		S NORD	• •
:	ארן סביינית	is BIT. C	sice Not	Bi asi	7 AEAI	J 70 7	ALE.	Aveniri's	e-Squi	ee .	
,, 	HAYS HA	C INFONU	uso Gun	77/4	16		Coas			ar Rs	.2 .
			Has Awa				:			_	•
					1 .		_			An Ang	
			4 15 1712								i :
· <u>i</u>	. <u></u>				1-1-1-	<u> </u>	<u> </u>	<u> </u>	.		‡ -
1500	- Sanz	Quart & C	AMPS. H	gos sin	Brown	47 8	SUR	For	orant 1	GFRL BAN	le
	HAYS AU	STARS	MAT. SAL	Machio us	10. Cun	SOSPLAN	of U	SOOL.	Ans He	Dion's	
	HAUR AN	4 Mosen	s us/ ME	CHANGE	OF SAM	Purc	mocri	oue			
				_		- 1			is win	to 10 M	•
	HONORY	7 - 119	rams is	ואר אוטן.	W. 5P. W	mers.	3 NEE !				٠,
: 1						1-1-	; ;	· · ·			
153	- RPS	5-64-6	- عن	Bau C	many	Samo	e TAK	14 کد	1 Sound	OF A/W	
										flass Jan	
			<u> </u>		<u> </u>	- 	<u> </u>	: 	• • • • •		-
						و السلم	- الاين			<u>,</u>	
									own (oneun	135
?い	14386 3°	T. er. 35 _	up From	1 C-1911	POTNE.	<u> </u>	7. GUAS	is JAL	<u> </u>	•	
1630	- Sou B	omoc c	SCATIONS	Ostern.	4500 B	y Use)c .e./		- 555.	DIAGRAM	, P
						24.4				121400111	
1645-	Conou	n Con	NG Com	Mary A	nus	2773	us		i !		:
	1		ENKO -								
									Fram C	cupres	
	HI PHUS &	ons, ast	-32 R	FARY TO O	aru cos	330 1	2/1/8	7			<u>:</u>
-!									<u>:</u>	· · · · · · · · · · · ·	<u>i</u> _
1700-	1 '		SCOUL C	Denie A	enuin	الم الم	HICE	GRANT	TAKE	0,com	5 2
	OFFSITE	•;			1	+	-			.	· · • · •
	+++-	+	 		 	+-+-	+		+ + +		
	+++		 			+++	++		Conti	nued on Page	<u> </u>
	<u></u>	-ii				d and Unde	erstand D.				
In .	I Roller	A	.,1	. /		- 5.74 5 770					
-{ lul	Signed	~1	11/	30 (84	- -		C:				
• /	J. J. 1. C. J			· · · · · · ·							

																				ń	iOle	טטט	K N	ပ	<u> </u>							
JE	CT_																					Co	ntini	ued F	rom	Page	·			-		
-		·																					·						\neg		$\overline{}$	٦
18	ري ⁻		P.	4	~	Ax	n.	07	•	B	resa		×J3																		+	٦
	\sim	_		·		Co	$\overline{}$	1																					_	_	+	-
	_	-	1	l	i .	i i	1	1	1 1)) (1								(Ø			_		$\neg \dagger$	1	\rightarrow	_
	-	1	1	T-		25		1	T	1						177	2	<u>, 223</u>	u	20	* <u>C</u> 3			3		3	_			\vdash	\rightarrow	
		_	10	22	702	0.	01		7	2	2			į	9		-											-	-	-	\dashv	
1-		-	100		247	PA	0	(3		<u> </u>		7₩	·U	_	-		-	 												-	\dashv	
		_	 			_			- 4																		1 0			\vdash	-+	
	20	-	1	1	1	1	T	T -		I 1				L			-		I		Ī				7		73	14		\vdash		
 -		-		Ι.		CF	ı							l					1				l	1			_			\vdash	\dashv	
		-				ع	1	1	I	1 1	1						1				Г					I -		1				
-	_	_	4	Pou	<u>w</u>	L'	-	4~7	<i>b c</i>	K.F	2	ک	e	12	11	۷	<i>H</i> د	2~	LT	2	אנ	co	BL	C	Hif	PER	<u> </u>	u	- ~	!/		
_	_	_		Ι.	<u>इहा</u>	I -	_	_	_																					\sqcup	 	
-		_	-	14	945	74	4~	los	72	res	3	ru	0	مح	سهر	4			_									<u> </u>		\sqcup	\vdash	
.	_	<u> </u>	-	_		<u> </u>							_	_				<u> </u>			_	,				ļ			ļ		\vdash	
18	30	-	M	EA	bir	in	m	26	59	ga	140				<u> </u>									ļ	ļ			<u> </u>			\sqcup	
			<u> </u>		<u> </u>			 							<u> </u>														L			<u>_</u>
19	48	-	1	21	bu	Ca	m	W	32				_	ļ	ļ										ļ		_				·	L
			<u> </u>		<u>_</u>									ļ																		<u></u>
_	Ŀ					5				u	F	4	res	6.7	oř	Co	٠,٨	6	20	קדוט	25	صر	ار ب	عودا	47	_			_			
7	20	-	Gn	9~	V	OF 1	51	2	•															<u> </u>	_							
_					<u></u>			<u> </u>																								
_													Ĺ																			
															_																	
												,															1					T.
																						<u> </u>	_	1					\vdash			Г
	-							1					\vdash	1	\vdash										<u> </u>		\vdash					\vdash
-	-	-	T										<u> </u>						 		_	 			-	-	 		\vdash	T	┢	-
	-	-	\vdash	 	T^{-}		-	-				_		-	\vdash	-		-		-		 	-	_	-	-	+-	 	\vdash	 -	╁┈┤	-
		-		-	\vdash	\vdash	 	 		$\vdash \vdash$		-		 	\vdash	-		_	-	-			-	-	-		-		<u> </u>	 		-
		-	 	-	\vdash		\vdash	-	! 						\vdash	-	-		-		-	-	-	-	-	-	+-	-	 	 	\vdash	-
		-	-		-		- -						<u> </u>	 	-		-		-	-		_	-	\vdash	-	Cor	tinu	ed on	Pac			L
		L	<u> </u>	Щ	L	L	L	<u> </u>	L				L	<u> </u>		L	<u> </u>	L	<u> </u>	L	 _	<u> </u>	<u> </u>	<u> </u>	<u>L</u>							
	11.	1.				4				1	,],	4 la	a			1	Read	and I	Unde	rsto	od By	,										
_	<i>#</i>	w/\^	<u>r ∫ ∖</u> Sig	· <u> </u>	\pyph				•		110	<u>' ('/</u>	<u> </u>			-					Signe									Date		

	·	,																		N	lote	boo	k N	0							
PRO	JECT																			•		Co	ntin	ued F	rom	Page	·			-	
i																															
	12/	1/2	14_	0	87	0		Dr	u	15	0	ومر	112		G	M	7	, 4	ris	ربہ ر	يون		on	23	,12	-					
	•	L	Ľ																												
		<u> </u>	_	HA	عال	AL	asq	24	I	mi	4	1	کس	//	19	25	-	(0)	v	26,	3_		17	22	5	۲	23				
			ļ	1/3	13	4	200	ļ Ē	2	2	23	0	4	2	- ^	276.	47														
					<u> </u>																										_
		_		10	3	4.	منظم	200	<u> </u>	در	22	4.	32	ي ا	251.	~		7	2	" S	Pu	,-	513	V 00	ه د	5 7	بعع	אר זי	~		_
		\perp		95	4	<u>*</u>	1	00	31	300/	rin	6	Co	5	vu	5U	SC	ے م	ىدى	774	u	35	H	9-	H.	0	723	oes			_
		-	4	ومهزك	w	Hz	0	75	12	62	03	4	15	É	وبر	_	w	2'0	5	اكستا	12	4	73	3	: (ح	PL.				_
		\perp	_{	10	ZJ.	7	64	F/	015	173	0	12	84	m	re	F	522	_ /	ge.	CHS	5										
		_	1	In	a p	16	15	A I	<u>M4</u>	un	M	معين	76	1	204	65	00	_	1	- 6	14	~	2	,5	OF	5/	PACE	13	红阳	122	~
		_	1	na:	(1		. [ſ	ĺ	1	í	f .																		
																															L
	08	<u>332</u>	5	Ac	-	In	un	<u>ري ا</u>	O	لم	SE	3/1	\$ -	7	W	C	011	USA		Os	P	500	ے	30	سرد	كالمد	<u> </u>				
				<u> </u>	<u> </u>								<u> </u>									Ĺ									
	084	Ø	it	سيركم	6	es.	20	ارى	2	2	2	27	س ر	/	00	PF	u	(Sv.	gu.	res	VE	_	H	vu	ی	E	61:	20		No	2
			P	1-1	01	50	ru	ı A	-1	03	1	5-	_	CA	13:	A	30		-		2 - 2	PA	J								L
					<u> </u>	<u> </u>											_														L
	08	3 52	} -	0	eru	, e		145	2 1	me	10	1	b	8.		A	o	w	3×	1	Pen	4	26	رحر	46	ce.					_
			_	FA	سرط	13) 977	me	1	190	2	Ea	مد	2	Pt	25	u	2	0	en	50	-	770	iH.	مع	2	93	2			_
			-	H.	05	ADU	. (000	3 10	134	1	2	.5	14	Fa	bus	150	Tan	OF	Pc	46	-	H_{2}	<u>م ج</u>	36	0	6	7			_
			-	A	161	<u> </u>	Fu	4/2	1	(48)	بدو	65	1	190	2	351	كد	A	_4	111	2	2	5	4	0	ىر	34	2			L
			<u> </u>	B	2	0	- 3	A	LS.	1	2_	BL	AL	4.3	A	20		2	ىيخ	ے	1	16	14	12	19	2.	2	0,	ے		L
		<u> </u>	<u> </u>	2	PPV	-	ļ	ļ	<u> </u>				L	L	<u> </u>		↓_	_	_	<u> </u>		_	_	_	_	<u> </u>	<u> </u>				L
		1	_		<u> </u>	<u> </u>	_	_	_			_		_		<u> </u>	<u> </u>		<u> </u>	$oxed{oxed}$		<u> </u>		lacksquare			<u> </u>		_		L
		_	<u> </u>	175	45	con	1 2	b /	2 _	\$4	2/4	L	2	2	.5	- 1	0'	بم	_	3"	<i>S.</i>	21	- 5	وحر	-	<u> </u>	<u> </u>	<u> </u>	<u> </u>		L
<u> </u>	-		<u> </u>	<u> </u>		<u> </u>	ļ	<u> </u>	<u> </u>		<u> </u>	<u> </u>		<u> </u>	<u> </u>	<u> </u>	<u> </u>		1_	<u> </u>	<u> </u>	ļ		<u> </u>		<u> </u>	<u> </u>	↓		<u> </u>	L
	0	910	<u> </u>	a	for	1 0	35	u	91	on	<u>ں د</u>	1	FU	754	46	41	1	252	سم	Ho	E	-	74	12	25	16	2 51	pg_	10.	عمر	È
▝			<u> </u>	162	91	14	1465	E	460	43	3	ur	17/2	2	15	Ho	0	<u> </u>	30	72	2 -	A	1	197	1_	34	12	101	<u> </u>	<u> </u>	L
		1	<u> </u>	uz	A	4	2	_ع	P	02	Kz	رط	77.5	w.	┫	904	1.	77	15.	K		<u> </u>	_	ļ	 	<u> </u>	↓_	<u> </u>	—	ـــ	L
■		1_	<u> </u>	↓_	ـــ	<u> </u>	<u> </u>	 	<u> </u>	ļ	<u> </u>	<u> </u>	<u> </u>	↓_	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	_	1_	<u> </u>	<u> </u>	ـــــ	 	<u> </u>	↓ _	L
▄┝╌┤		\perp	┷	<u> </u>	<u> </u>			1			_	$oxed{\bot}$	<u> </u>				_	1			144.	710		-	142	1		1	4.	ļ.,	
⋼		↓_	↓_	1	↓.	<u> </u>			ام	foc	An	1		<u>35</u>	2	1	ma	, COK	14	- W					1000	477	2CA	Γ.	لسٰل	1	
╻┝╌┤	09	45	↓_	30	w	La	120	\$	12	,- (-	3	 . 	on	1.	5'	<u> </u>	K	100	re	4	<u> </u>	15	7	_	H	W.	<u> </u>	17	5 6	Ź
$\left\{ -\right\}$	<u> </u>	-	<u> </u>	PS	ŧ		tu	15	811	-	83	1-1	<u>o'</u>	}_	701	7 .5	ή-	15	17	Ac	1	4~	0	6	15	2 ج	<u> </u>	15	A	├ —	Ļ
		1_	1.5	LTY	153	مت	-	Bri	س	>	M	063	† ,	7	058		Su	Tu	*/ i	IN	C	pro	1 4	co	50			61	pre	<u> </u>	L
			Ļ	<u>L</u> _			<u> </u>		<u>L</u> _			<u> </u>	uu	M	ru	TIL	<u>_</u> _	L	<u> </u>			<u></u>	<u> </u>	<u></u>		Cor	ntint	ed or	Pag	<u> </u>	_
1				_	Λ											١	Read	and	Unde	ersto	od B	y									
il	. /				X	A			•		nl	1/4	4					•	١												

Date

Signed

Date

Signed

Read and Understood By

12/1/85

Signed Signed

Date

_																				iA	OLĖ	ننن	KIN	u								
JE	CT.																					Co	ntini	ued f	mon	Page						
																	- (Ī										-
		 		-	-	-				_															l				-	\rightarrow	-+	
	-	┼	_		-	÷					-		-												_			_			-+	_
4				-		A			-					-	-			\dashv							_	-	\vdash	-	\dashv			_
	<u>.</u>	 	_	ļ		И	K																		 			\longrightarrow				
		<u> </u>		<u> </u>		U'	17																									
		<u> </u>		<u> </u>		<u>II</u>				,											İ											
		-										31.0	١.,	W.								i		·								
_		1				المعدر				58	2	o'É	1				56	12	3 E													
	-	1		RA	Co	10					<u>7</u> 8	2					(3)	- 1	L N													_
		+	-	┼	YD.			-		-Q	9	- 4												-		_	-		\vdash	Н		
ت حد . (۱/۱۸)	14.2°	4	19		58		\vdash	-			w:	5 - 1	PE	-			-							\vdash	╁	 			H	 		_
	-	+	1.	-	20	1	<u> </u>			\vdash		-	-	-			 	8		, C	Р5			ļ	├	-	$\vdash\vdash$	\vdash				-
٠,	-			K& 7		12	10 _						 	<u> </u>	<u> </u>	\parallel	-	\vdash	\mathbb{H}				<u> </u>				\vdash	<u> </u>	<u> </u>	_	<u> </u>	_
		-	u	104	41	->							<u> </u>	<u> </u>			_		Щ				ļ		<u> </u>	_	<u> </u>	 				L
	<u> </u>	1	<u> </u>										13.1	5€					Ш						<u> </u>	<u> </u>						
					ķω:	10	Ð				C	P-I	169	E					Ш													ļ
į	Ko	XF.	/	—		D						9			-																	Γ
	50	POW															1		Π						1							
·*	71			C	₩ 3	(₽						_						111				-				\vdash		<u> </u>	\vdash	\vdash	H
	**				,	_	-	-	-	P2	2	5.5	5	9'6			 		HH					-	-	-	\vdash	\vdash	 	┝╸	 	╁
	 	┼	-	8-45	214	(2)	}			O				15	-		-		H						-	-	-	├—	╁	 	-	╀
)_	┼	_	+	├	-	<u> </u>	_)			-	-			-								-	├	├	 	├—	 		╀
_		<u> -</u>	<u>. </u>		ţω	A C	0_						ļ	<u> </u>			<u> </u>		Ш							ļ		<u> </u>		<u> </u>		ot
عنا	<u> </u>		_																Ш			_,		L_				_				L
	١.	_		ļ]										٠			56	12	35	5			<u> </u>						
	1	ocii Affa	سو		->						C	P3_	37	8's		5 4	8	32,) -	0		17'8	{ E									Γ
		1	-									C	19	Έ			 4 4 -															T
	;		سم			T	1						1										_			<u> </u>	 	\vdash	\vdash	 	-	T
	1	58			B	1	 		-								12			Δii	1			 	\dagger	\vdash	\vdash	\vdash	 	 	1	\dagger
}—	-	/3' <u>S</u>	40	<u> </u>		-	├	-				╁	-	╁─		56	13 8		-	sgü D	1_	-	-	-	\vdash	╁	┼	}	-	-	-	╁
	╀	╄	-	-	 	-	╂─	-	_	_		├	├	<u> </u>			-					-	-	├-	┼─	┼	┼	 	├	┼—	├-	+
ļ	Ro	<u>, </u>		┝	7	D-	▙					ļ	├		-	_			<u> </u>	-			!	├	ļ	-	 	<u> </u>	├	—	ļ	╀
<u>!</u>		בממנו	<u>} </u>	<u> </u>	<u> </u>		_				٠												<u> </u>	<u> </u>	<u> </u>		_	<u>L</u>	<u> </u>	<u> </u>	_	Ļ
بغيا		1.	<u> </u>										1												<u></u>					L		
,	,			-			1																	Ì								
•						1																			1							T
				١.		\top	1		†					1										┢	T	1	1	<u> </u>			\top	T
	 	+	┢	1	╁	1	 		╁			-	╁┈	╁┈	 			<u> </u>	\vdash	 	 	<u> </u>	\vdash		十	+	\vdash	\vdash	\vdash	\vdash	†	t
		-	-	├	├─	┼	╁	╁		-		┼-	┼	╁	\vdash	┢╌		-	╁─	-		-	├─	-	+	\vdash	╁─	-	\vdash	+-	╁─	+
_		-	-	 : :	-	-	 -	-				\vdash	┼-	\vdash	\vdash	-		-	-	┼	\vdash	-	-	-	\vdash	<u>_</u>	<u></u>	<u> </u>	<u></u>	<u></u>		上
		1.	L	<u> </u>	<u> </u>	<u>L</u>	<u> </u>	l	<u> </u>	L		<u> </u>	Continued on Page																			
			h	·A	/	,	\bigcap	/	1			,				F	Read	and I	Unde	erstoc	od By	,			•							
ا بر-			/,	//_			Х	54	4		12	/رو						٠.		.,						•			٠,			
<u>, .</u>		T.L		ned	4		de	~	•	_	. 2		**	··	_	-		·			Sign				-		`	<u>- `</u>	<u>نـ</u>	Date	<u> </u>	_
· .		'	DI S	, i e a			_					Ja	I.C								JIYN	ď								UULE	5	

2RC)JE	CT_	-		RPS-CB5-(0-1) - SAMUE PAKEN IS A PARC GREAT STOPS SAMUES, THE STOPS SAMUES PAKEN IS A PARC GREAT STOPS SAMUES PAKEN FOR CM. IS CA BOS GLESS JAZ RPS-SB5-0-2 - SAMUES PAKEN IS SAMUES ASOUTS - THERE WAS THE HOW DITTON OF HOSE - SUBJET AMIT ~ I" 3 MINIETS AFTER SAMUE WAS PAKEN COMMIND FOR 3.35 IS 43' SAMUE OF NW COMMINISTIS AFTER SAMUE CHATSON FOR 3.35 IS 43' SAMUES OF ROOF STRUCTURES. RPS-CW-CW4 - COMMINIST OF ROOF STRUCTURES. - RPS-CW-CW4 - COMMINIST WAS AMITES FOR SAMUES FOR SAMUES. GUTS JAM COLORDON IS I SOUTH OF N/CE WASEL AMO " ASOUT INSTITUTE AMOUNT AM													-														
																																L
	12	25	-	R	25	- 0	β	5	- (c) -	<u>'</u>)		-	54	406	٤	79	jes	ک	19	A	DA	ne	_ (ma	مهر	Sid	بو ز-	5	225	2	_
_				No	2>7			74.	<u> 5</u>	127	0	5	9m	803	0	Fox	(س	1-	<u>-</u>	10	- 1	<u>30</u>	3 (50	کک	J	72				_
				<u> </u>																			<u> </u>		ļ			<u> </u>				L
	12	3	<u> </u>	R	95	- <	1	5-	0	-2		-	54	este	5-1	Me	ليمؤ	13	5	92	Se	45	A	٥	3	_	721	120	م د	بحد	5_	L
				7	6_	HS	ر، ح	، ر	ړ ت	722	1 6	خود	Ho	بري.	5	461	17	gsn.	1	~	1"	3,	2	إعدا	25	.40	المحا	<u>-S</u>	m	ore		L
				w	73	5791	in								ļ					ļ		<u> </u>	<u> </u>		ļ					<u> </u>	<u> </u>	L
1		_		00.	472	نع	70	2	3.3	5	l.	5	43	<u> </u>	5	معد	74	OF	٨	نب	Co	سم	<u>~</u>	4	رك	6 4	1'0	TEC	اح ح	عود	<u>. </u>	L
			_ (ma	Les	TE	FA	0	Bż	25	مع	<u>ع</u> د	00	77~	ઉન્ડ	Of		000	<u> </u>	ne	u	un	2	-	ļ			<u> </u>	<u> </u>			L
		•	1	464	ند	Acc	me	ناديا	-	70	SA	wr	سآمدا	Pu	مهو	עע	1.4	g.	2	Jul	a	ر :	10	on	<u> </u>					<u> </u>	<u> </u>	L
				_						ļ			<u> </u>		<u> </u>													<u> </u>			<u> </u>	L
	C	11	30	-	RI	25-	CU		ω	4	-	Co	re																<u> - </u>	~	80	3
				Gr	13:	3	12		100	eq?	حرو	, ر	5		1	Sی ر	4	01	1	نع	u	190	L_	.42	صر		"	4	<u>322</u>	2	F00	3
			_	<u> </u>		<u> </u>			ļ					_			<u> </u>				_								<u> </u>		<u> </u>	L
																						<u> </u>	<u> </u>				<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	L
,	_	0	u	in	5 6	for	- 4	351	4	ne	جع	~(<u>)</u>	~	- 5	12/	27	CL	3/2	S,	-15	- 1	ىم	P	مع	1	حر	2	30	4			L
_				_	_					ļ												<u> </u>			<u> </u>		<u> </u>	<u> </u>	<u> </u>	L		L
12	45	6	22	18	2	Ou	ممل	س2د	_	es	202	- 1	(O)	(u	2	4					<u> </u>			<u> </u>			<u> </u>			L	L
				_			<u> </u>		<u> </u>													<u> </u>			<u> </u>		<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	L
			<u> </u>	ļ			<u> </u>					_			_		<u> </u>	<u> </u>				<u> </u>		_	<u> </u>	<u> </u>		<u> </u>	<u> </u>	<u> </u>	<u> </u>	L
								ļ	<u> </u>													<u> </u>			<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	L
1	330	-	6	44	0	0	on	200	_	An	m	1	3-32	16_	ىدر	3.7	2_	_			<u> </u>	<u> </u>		_	<u> </u>	<u> </u>	<u> </u>	ــــــ	<u> </u>	<u> </u>	<u> </u>	L
_			<u> </u>		_		<u> </u>	ļ								_						<u> </u>		_	<u> </u>		<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	L
_	<u> </u>		ļ	<u> </u>	_		_	ļ			<u> </u>	_	_					_		_		igspace		_	<u> </u>		L_	<u> </u>	ļ	<u> </u>	<u> </u>	L
1	35	> -	1	914	1//	un	4	5	Bi	4-		_		_			<u> </u>				_	<u> </u>	ļ	<u> </u>	 	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	L
<u> </u>	<u> </u>		_	<u> </u>	_	ļ	<u> </u>	ļ		_	ļ		_	_	_		_					↓	-					<u> </u>	<u> </u>	L_	<u> </u>	L
L	HU	<u> </u>	Lf	PS	- C	4-	50	36	1- 2	3.5	10	<u> </u>	3	<u> </u>	3	-7	-8		Rs	ca	سيعط	2 =	1	7	-4	H	N	س	=	B	<u> </u>	L
_			5	m	15	15	<u> </u>	TOP	2	1-1	<u>8 "</u>	15	1	14	65	ميد	27	Su	uć	**	8	-13	2"	د،	4	510	<u>-</u>	B	262	<u>~</u>	<u> </u>	Ļ
<u> </u>	_	<u> </u>	1	tea	40.	150	161	104	Pu	PS E	Ł ,	5	105	1	12		15	12	<u> </u>	54	وما	رسا	150	4	10	gra	13	<u>20.</u>	ىم	70	ļ	L
	<u> </u>	_	14	3AL	46	21	<u>^</u>	ias	 	us	05	رجد	_	Fin	72	200	ער	رس	4	<u> </u>	10	\$'s	ent	<u> </u>	-	_	<u> </u>	 _	ـــ	<u> </u>	<u> </u>	L
_		-	2	An	P. s	4 64	1/_	1.5	" S	Pu	15	/a	ب		_	_	<u> </u>	<u> </u>			_	_	<u> </u>		<u> </u>	_	<u> </u>	 	 	\vdash	<u> </u>	L
	_	<u> </u> -	H	10	20	* 1	144	بسط	7 11	m	1	ruG	n	Can	~6	يع	3	5'	R	W			ļ	_	_	<u> </u>	ļ_	<u> </u>	 	<u> </u>	 	L
<u> </u>	<u> </u>	-	_	3 ₂	Pur	c	8	5.	10	40	16	aci	5	H	93	14	10	بمدر	VIN	5	108	6	ju	2	1_	9	0	207	<u>*</u>	<u> </u>	<u> </u>	L
<u> </u>	_	<u> </u> -	17/	Kr.	1 cu	193	M	usn	4	in	5	34	1	zu	17	6	17	e A	20	0	E	ىدى	t 5	m	20	15	مديم	<u> </u>	عيد	y ·	ـــــ	L
		_	L	422	-	17	rs	5	<u>\$114</u>	<u>k</u>	DE	10	מן ט	es	r	2/	71	۷.	547	10		?		<u> </u>	<u> </u>	_	L_	<u>L</u>	$oldsymbol{ol}}}}}}}}}}}}}}}}}}$		<u> </u>	
		<u> </u>	L	KAi	w	13	46	FA	7 00	وسع.	bur	AL	من با	ne	On	ر وب	D,	44	4	41	1	18:	1	Fre					ed on			
	1		0-		, ,	2	، دست	4			1	2/	//	g	7		l	Read	and	Unde	rsto	od By		من		- 14	<u> ب</u>	- 5/	-	+ 6 €	-	
	A			—∕—\ Sig	ned		-			•	_		Da	te		_	-			<u> </u>		Sign	ed								Date	

t.																				i١	ote	000	KIN	o								
E	CT_			<u> </u>															•			Co	ntini	ued F	mon	Page	•			-		
_			i																										_			
Η.	, -		-	_	}_	-	_	ļ							- 4									_			يهر					
4	50	0.	<u> </u>							on	<u>ر</u>			*			u	ديو		ov	بهر	- 4	4 /2	01	- /	7'>		سو	-			
7				100	ar-	1	مامحد	F /-																								
L				_			-		7	7			لہ						<u> </u>										· .		\dashv	
			<u> </u>						_	1			ᆫ	7_					ļ					٠.		<u>. </u>						
<i>l</i> _										1																						
}										17	5	'		-								i										
				1						1																						
									_		_	_	_	H	و	رہ	Su	M	P													
_				t-	 			-						<u> </u>																		
			200	100		5 (da	-	7		30	10					0	.5/			3	رمه										
	0		100			} 	977	1		 '	770	رى		~	<u> </u>	1400	174			~	7.5	, ~		7	٦		-	_		-		
_			├		-	-	-	-	 			-	-		-	-			 -							-			 			_
	7	0	<u></u>	_	-	-	-	_	-	_	-	_	 	ļ		-	<u> </u>	_	}	_				-	-	ļ	-		_	-	\vdash	
	K									10				<u> </u>		<u>o'</u>	Ê	P	<u> </u>	لعا	Co	ris	73/2	-0	bx	1	er	1	49.	<u> </u>		
_		4	o	2	8"	u.	1	صه	1	Fox	77	16	<u> </u>						_					-			-		_		-	
		ļ	ļ	<u> </u>	<u> </u>	<u> </u>		<u> </u>		<u> </u>							_	<u> </u>	ļ	_						<u> </u>	<u> </u>			<u> </u>		
	j		<u> </u>	<u> </u>		<u> </u>		ļ				ļ	_					ļ	ļ								<u> </u>					
<u> </u>																																
16	05	_	1	795	-	MO	-	CF	5	_	51	M	2	7914	in	<u> </u>	M	in	140	ىدى	ح	CA	100	يمع	عو	4	- -	ur	515			
										(
1				1	1	1	I .	1					ł .	1	l																	
)																																
16	30	-	RF	۲.	-	1 -	C	PI	_	TA	-Y-	51	ma	رنديم	00	60	Con	Ess	2.	R	0	200	21	١ . ١	21		_	1	2	2.70	F 10	
	,		1	i	1	ŧ		L		to.		3,	•		ı		1	1	1	_	ł	i _	ı	1	1		سو	1	1	ري	l 1	
			ı	i	1	1	Į.		4	in				, <u>, , , , , , , , , , , , , , , , , , </u>			1		22		0	70				024		-/	n/K	50		_
1/2	50		1 -	i_	CU		~ (700	LAPE	SA			•	CH	-	70.	1	_	06-					 			-					
0	3 <i>0</i>					f -	-11	1	_	F 1		1			l .	1			1		cris					30	-	┢	-	-		
Ц		6	EAN	אמ	15	25	6	" 2	01	W	رين	Con	WZ1	· A	20	4	5	OF	w	ω	n	_3	ريما	- 6	<u>k</u> .		<u> </u>	<u> </u>	-			
			-		-	-	 	-	-			_					-		-	-					 		-	-		 	\vdash	
-		· .			-	-	-	-	-			60			1	_	-	<u> </u>		-	_				-		-	<u>L</u> .		1		-
Ŀ	230	-	KP	5-	C	<u> 11-</u>	C	P2	-	SA	nPi	2	F	179	MY	Si	or!	762	12c	1	Con	Ra	20	-/	0.4	0.	0	E	0.1	102	2.72	•
_		1	cA	20	<u> 1</u>	<u> </u>	37	8	<u>" </u>	cu	n c	2	Nu	i Ci	نسر	2	<i>A</i>	2	14	É	oi	4	بنان	Ave	<u> </u>	55	2	8				
!				_	<u> </u>	<u> </u>								<u> </u>			_	 			<u> </u>			<u> </u>		<u>L</u> .	<u> </u>			<u> </u>		
]		و موکا	ر ند	An	0	n	75	-	12	er.	2	17	00	H	5	A	-3	-	Ex.	72	34	سع ل	1	45	مج	<u></u>	ط	A	ورد			
;		PA	224	0	 	80	is	6	re	eci	٢	مكرتم	ري	5																		
7	74	5-	1	PPS	- 4	21	1-	Cr	4.	+		کند	20	ei	7	30	9	UK	7.	92	N	00	= ,	Pa	440	,	8, 5					
			u	40	/	•	,	A		Di.			72.0												<u> </u>		<u> </u>					
								<u> </u>		<u> </u>		 		SDOM POUR SONTE Continued on Page																		
7	"																															
	/	B	Read and Understood By																													
	<u> </u>	ml	mly 1/2 / 12/1/24																													
П	_		Sig	ned					Date Signed Date												,											

Signed

Date

																		N	lote	poo	k N	o. <u>_</u>	 .		_				
ECT	<u>.</u>																			Co	ntini	ued F	mon	Page	· <u>·</u>				
3 40-	6	20	79		3/2	سد	~~	r	(٦٤.		-	-						1								_	7
		,,	,																									$\neg \dagger$	\dashv
																													7
																									-			\neg	7
																-													\dashv
12.7	39	-	1	ROY	_		در	5.45)tr/		<	R	0.	27.0	57										_	\vdash			
			-44					,				-	7	-												_	i		
	1	i.	~/	2	A.	5%		52	PX		14	ومد	-	Ca	w	0	2,2	1	-	А	PH	نىر	2				<u> </u>		
		<u> </u>	1,									-									/ .					1			
		1/5	u	54	•	5		P	3 X	51		1/2	23	ue	73/	,	ממ		74		1	S	رمد	2/	9				
	7	An	SZ		Pu	1	2 /	34	ek		0	J	_		w	u	7	ey	7	2	0	0	F	ا ا	۷.				
	13	57		69	درو	12	، ز	15	34		Į,	W	ar.	2															
																													-
																_									·		<u> </u>		
							-																						
											<u> </u>			<u>_</u>											L_		_		
										<u> </u>		_	<u> </u>	_	L				L			_				<u> </u>			
				ļ						<u> </u>		<u> </u>														igspace	<u> </u>	igspace	<u> </u>
\perp	<u> </u>				Ŀ						_				_	<u> </u>		<u> </u>							·	$oxed{igspace}$	ļ	<u> </u>	
							-				_	_		<u> </u>												_	<u> </u>	<u> </u>	_
	_		-		-					-				<u> </u>	<u> </u>		<u></u>									↓_	<u> </u>	<u> </u>	
			_	<u> </u>						_	Ŀ		_	_	<u> </u>	<u> </u>			<u> </u>	<u></u>						igspace	_		_
				<u> </u>	<u> </u>			ļ		<u> </u>	_	<u> </u>	<u> </u>	_	_	ļ										-	_	_	
		_	_	_	-	-				-	_	_	_						<u> </u>	<u>_</u>		ļ			-	-	\vdash	<u> </u>	
-	 		-	_	_	-		_	_	<u> </u>	<u> </u>	-	<u> </u>		<u> </u>	 	<u> </u>				_		-	-			-	_	_
		<u> </u>	-	-	-	-		-		_	-	_	-	_	<u> </u>	-	_						_	-	_	-	\vdash	-	-
-+	 -		 - -		<u> </u>	-				-	_	_	_	<u> </u>	<u> </u>	_	_	_	<u> </u>			_		_	-	\vdash	 	 	_
			ļ			<u> </u>	-		<u> </u>		<u> </u>	_	-	ļ	\vdash	_		-		-	<u> </u>			 	-	-	-	 	<u> </u>
-	├—			_		-	-	-	<u> </u>	_		_	-	-	<u> </u>			_	_		_		<u> </u>		-	-	_	_	_
-			-		_	-		-	-	\vdash	 	-	_	\vdash		-	-	-			-		-	\vdash	\vdash	+-	-	 	
	 		_	_		<u> </u>		_		 -	-	-	_	-	1_	-	-			-	_	_	-			ا_	Per	<u></u>	
		L		<u> </u>	<u> </u>	<u> </u>	_	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u></u>	<u> </u>		<u>L</u> .	<u> </u>	<u> </u>	<u> </u>	L	L	<u> </u>	<u> </u>	<u> </u>	Cor	HINU	ea 01	n Pag	-	
	1			K	1	1	A	_	/	'2/	121	15	5	•	Read	and I	Unde	rstoc	od By										
<u></u>	Sign	ned					•			ba	ie (/	_	-					Signe	ed .				_		_		Date	

) Pop	ìO.	JE(СТ_																		_	. N	lote					Page	<u></u> ∸				
	Ť	_				<u> </u>	 									<u> </u>				_				,							- ' '		Ť
3-	1			-	,			 		-	-					-																	t
_	7		1	2/	12	10	9			5,		14	Sec.	c 2	100	<	24	.0	2	C.	-	Ø	EX	216		50	10	53.	5-5				T
	\dagger			1	-	10		\vdash			2	27	7/2	7 69	~7.	3	77	100	-				22	302	_	27	-	10	7_		<u> </u>		T
<u>`</u> _	\dagger	\dashv			 		_	10	1	100			 	101			\vdash			2				CIC							·	7	t
	Ť	\dashv		-	 	01		12	\mathcal{H}	18	7-		 	79	<u> </u>	72			L	2	1.11		D :	7	-	27	152		<u> </u>			<u> </u>	t
-	+	\dashv			-	~	-	15	-	 		2/	u	_		 	_			_			-				2		-			 	╁
-	+	\dashv		-	-	177	XX	15	-	1	<u> </u>	18		1.	مره	4	00	22		190	OH!	22	C	27	<u> </u>	111		-					+
┞	+	\dashv		-	_	\vdash	-			\vdash	-	<u> </u>		 	1				-	_			-/		_	-			 	-/	, -	-	1:
+	+	\dashv			6	-	177	120	Ha	5 6	بعر	1	2/	12/	121	1	5	مسعت	ص	23	101	- 4	12	00	E	256	10		2	٤_		 	+
-	+			_		-	<u> </u>	 				 	-	_			1		-	 	 	<u> </u>	_	-	ļ			-			<u> </u>	├—	╀
_	+				-	1	35	70	מדע	ے سے	202	277	n	2	مع	22	-	12	113	<u> </u>	32		ر ما	2/5		وم	n	2	-				+
	\downarrow	_					ļ.,			<u> </u>	 	_	-	_		-		_	_			ļ	<u> </u>	<u> </u>	<u> </u>		ļ	<u> </u>		<u> </u>	2. T		1
-	1	\downarrow		ļ	ļ	2	HZ	_ب	Gn	1	7	6	-		19	EL	A	عب	11/2	-	ni	25	w	E M	2	4	F	<u>pu</u>	_			-	Ŀ
	4	_				<u> </u>	ļ	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>				<u> </u>	L	ļ			ļ	<u> </u>	ļ			.	<u> </u>	<u> </u>	<u> </u>				\downarrow
,		_				<u> </u>	تىخ	2 1	Br	-	3	12	954	22	me	7	6	تعظ	47	200	ب	ŀ									-		1
		_						<u> </u>						<u> </u>		<u> </u>				<u> </u>			<u> </u>			<u> </u>	<u> </u>	<u> </u>			L		
					_	1	1/3	. 4	رجر	12	n	5	110	ruc	2	1	34	2	Fa	<u>. </u>	0	6	29		0	2		0	2	. //	1	<u></u>	L
L											<u> </u>							<u> </u>	<u>l</u>		<u></u>							<u> </u>				Ŀ	1
																٠.					<u> </u>	<u> </u>							Ŀ				Γ
	7																																
																																1	Γ
									1.																								T
	T																																T
	1							T																									T
	7																									-							T
	†			 			1	T				T			 		 		T								\Box	<u> </u>			3		T
	+		_				T																										t
	\dagger			\vdash	<u> </u>	1	†	 	<u> </u>		T	\vdash	T			\vdash	\vdash	T							1	一	\vdash	一				\vdash	t
	\dagger				1	1	1	T		\vdash	 	<u> </u>	 	I^-		\vdash	<u> </u>	†		一	1			Ė	 		\vdash		-			-	t
_ -	\dagger			 	\vdash	T	\vdash	\vdash	1		 	\vdash		 	+	\vdash				\vdash			-	<u> </u>	 		\vdash	\vdash	 	<u> </u>	-,		t
	+			├─	\vdash	\dagger	+	╁╴	+		╁──	 	-	ļ	1	-		-	\vdash	+-	\vdash	H	\vdash	<u> </u>	 		 	1-	+-	\vdash		\vdash	t
╸	+			-	-	+-	┼-	+-	╁	+-	\vdash	-	╁	┼	╁	+	\vdash	-	┼	╁╌	\vdash	\vdash		-	 	-	├	┼─	-	-	9.5	╁─╴	+
1	+			-	\vdash	+	+-	+	+	-	-	+-	\vdash			-	\vdash	+	\vdash		\vdash	-	-	╁	\vdash	-	+-	+	 	+ ==	-	-	+
∮ ├	+		-	├-	-	+	-	+-		\vdash	├-	╁	\vdash	├	-	-	+-	+-	┼─	\vdash	╁	\vdash	\vdash	-	-	-	+	\vdash	+-	 	-	-	╀
•	+		-	+	-	\vdash	+-	╁╾	-	-	+	╁	\vdash	\vdash	-	-	\vdash	-	+-	-	\vdash	├-	╁	-	├	-	+-	+-	+-	 -	-	-	+
 -	+		 	-	\vdash	+-	+	+-		-	-	-	 	\vdash	\vdash	\vdash	-	\vdash	┼	-	\vdash	+	+-	+	-	 	+	+	┼	 	 -	+	+
				-	-	-	-	+-	-	\vdash	+	\vdash	-	-	-		+-	\vdash	├-	-	-	-		├	\vdash	\vdash	 	<u>_</u>	1	<u></u>		<u></u>	T
IF	1		<u> </u>	<u>l_</u>	<u> </u>	<u>l</u>	1		<u> </u>		<u> </u>	<u></u>		<u> </u>	<u> </u>	<u> </u>	<u></u>	<u> </u>	<u> </u>	<u> </u>		<u></u>	1	<u> </u>	<u>L</u>	<u> </u>	<u></u>		ntinu	PG OL	1 5.d/G	-	-
																			Read	and	Unde	ensto	od By					-	• •	•			

Date

Signed

Signed

Date

INDICATION IND. 17 4 'ROJECT_ Continued From Page__ 1920 Anc 0/13/17 SPAYED GULL MI HAS RSKUUTED نساورهما MAR 5 coresu Capil distinuis U CSULL 144 73 ADLITA TE 43% فبهرك ルンバ 19 Sump Pumin TE *4*~ HAYS DISAROWS 07/4.12 410° F CISAR GAPUT ONS 15 AFTONOON BY SEFFUNC San 17,5" 420 450EC From Court Kin MANMELE Φ/2/=-Pump 19 perves 24 Hrs RELATER HEDLEUTE RETURN IN Continued on Page Read and Understood By Signed Date Signed

				ook No
ROJECT				Continued From Page
· · · · · · · · · · · · · · · · · · ·	1910	- 1/-00		
12/15/89	7:10	- 40° F FOLE.	so up	
	une PANK	Ho brose	us.nr C 17.5	ravy
Coule	Kun MA	witer Cooker.	Same User	A3 12/17/39
	susement			
	Survivo			
Sun	PANZ IS	Sauseo wi	monther Com	Ans Suno
Pun	PIS Perus	y on		
	1 -			
1920 CG2ANT	OFESITE			
	+ + + + + + + + + + + + + + + + + + + +		+ + + + + + + + + + + + + + + + + + + +	
	+ + + + +			
	4-4-4-4			
			 	
	++++		+++++	
	+-+-+			++++++
	++++	+ + + + + + + + + + + + + + + + + + + +	+++++	
	++++		++++	Continued on Page
	-1		Read and Understood By	<u></u>
Signec	<u> </u>	Date	Signed	Date

ATTACHMENT 3

AmTest Inc.

Professional Analytical Services

14603 N.E. 87th St. Redmond, WA 98052

Fax: 206 883 3495

Tel: 206 885 1664

ANALYSIS REPORT

Rhone - Poulenc, Inc. CLIENT:

12/4/98 DATE RECEIVED: 12/13/89 DATE REPORTED:

REPORT TO:

P.O. NO.: 99990

Sue Hays P.O. Box 80963

PROJECT NO.: SEA27664.A0

Seattle, WA 98108

CONCRETE STORAGE PAD

Laboratory Sample Nos.	Client Identification	Copper (ug/g dry weight)
√ ₉₂₂₂₃₄	RPS-SB6 (0.5-1.5)	13.8
√922235	RPS-SB7 (0.5-1.5)	21.4
√922236	RPS-SB8 (0.5-1.5)	· 18.7
√922237	RPS-CU-CP6	<0.002*
/922238	RPS-SB9 (0.5-1.5)	19.5
922239	RPS-SB10 (0.5-1.5)	17.0 17.5]
y 922240	RPS-SB51 (0.5-1.5)	15.7
√922241	RPS-SB1 (0-1)	76.8
/922242	RPS-SB1 (0.7 - 0.9)	76.4
√ 9222 4 3	RPS-SB2 (0-1)	166.
√922244	RPS-SB2 (0.8-11)	38.8
√922245	RPS-SB3 (0-1)	130.
√922246	RPS-SB3 (0.7-1.0)	46.7
922247	RPS-CU-CP7	<0.002*
√922248	RPS-SB4 (0-1)	48.1
√ 922249	RPS-SB4 (0.7-1)	50.0
√ 92225 0	RPS-SB50 (0-1)	53.2 73.6]

^{*}Results are reported in mg/l.

-2-

CLIENT: Rhone - Poulenc, Inc.

DATE RECEIVED: 12/4/98
DATE REPORTED: 12/13/89

REPORT TO: Sue Hays

P.O. NO.: 99990

PROJECT NO.: SEA27664.A0

CONCRETE STORAGE PAD

Laboratory Sample Nos.	Client Identification	Copper (ug/g dry weight)
~922251	RPS-CU-CW1	173.
922252	RPS-CU-CW2	31.3
√922253	RPS-CU-CW3	35.8
922254	RPS-CU-SB11 (8.5-10.0)	22.3
√922255	RPS-CU-SB12 (8.5-10.0)	23.3
√922256	RPS-CU-SB13 (13-14.5)	13.4
√922257	RPS-SB5 (0-1)	88.6
922258	RPS-SB5 (1-2)	23.2
√922259	RPS-CU-CW14 CW-4	27.7
/ 922260	RPS-CU-SB14 (8.5-10.0)	11.5
√922261	RPS-CU-CW5	267.
922262	RPS-MC-CP5-BLANK	-
y 922263	RPS-MC-CP5	-
/ 922264	RPS-CU-CP1	220.
/922265	RPS-CU-CP2	390. 323.]
√922266	RPS-CU-CP3	145.
√922267	RPS-CU-CP4	0.129*
<i>§</i> 22268	RPS Trip Blank	0.004*

^{*}Results are reported in mg/l.

-3-

CLIENT: Rhone - Poulenc, Inc.

DATE RECEIVED: 12/4/98
DATE REPORTED: 12/13/89

REPORT TO: Sue Hays

P.O. NO.: 99990

PROJECT NO.: SEA27664.A0

CONCRETE STORAGE PAD SPIKE RECOVERIES

Laboratory Sample Nos.	Client Identification	Spike Concentration (mg/l)	Recovery (%)	
922240	RPS-SB51-(0.5-1.5)	5.0	46.0	
922251	RPS-CU-CW1	5.0	79.0	
922266	RPS-CU-CP3	5.0	89.0	

CLIENT: Rhone - Poulenc, Inc.

DATE RECEIVED: 12/4/98
DATE REPORTED: 12/13/89

REPORT TO: Sue Hays P.O. NO.: 99990

PROJECT NO.: SEA27664.A0

CONCRETE STORAGE PAD

	Laboratory Sample Nos.	Client Identification	Methylene Chloride
	Lab Blank		165. ug/l
✓	922262	RPS-MC-CP5-Blank	160. ug/l
/	922268	Trip Blank	160. ug/l
	Soils Blank		130. ug/kg
<u>/</u>	922263	RPS-MC-CP5	125. ug/kg

NOTE: Methylene Chloride was found in the Blanks and in the samples; therefore, laboratory contamination was suspected. Conversion factor may be involved, causing elevated value.

.

REPORTED BY

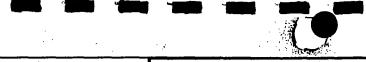
John T. Dayrey

JTD/pb

4-83 35. 8 1503 1532 100 क्ष 535 0 2 C 58.6 NICTOIRI ITION: WHITE - ORIGINAL ACCOMPANIES SHIPMENT 285 289 RELINQUISHED BY: (SIGNATURE) REMARKS BILL KHOWE PULLENCE SAMPLED BY AND TITLE (SIGNATURE REQUESTED COMPLETION DATE REPORT TO: CLIENT NAME 441,491,43S PROJECT NUMBER NO STA Ke (were ACT Sus Hars Riture Powers 11/1/4 11.24 11/26 11:29 11/29 11/29 10 ... 6 13/3 1887 ニババ = 7.8 DATE 127 1645 1545 CHAIN OF CUSTODY RECORD -35 06556 A 1415 1535 1010 1555 1570 1950 200 1946 1420 1745 がだ ĪME $\overline{\mathbf{x}}$ Z 乙 × X COMP CONCESTE STORAGE PAO PROJECT NAME ス L GRAB DATE/TIME RPS. 531-(22)(07.0.9) KPS-581-10-1) 1875-567-10,5-15 CPX-583 RPS-5B3 (v.7-10) RB-582-RB - 108-105-15 RPS-CH-CPT APS-5BZ-RPS-5B51-10.5-1.5 RP5-3B9-(0.5-1.5 RP5-5B10-10-5-15 KP3-CH - CP6 Marcity -S86-10,5-1,5 LABORATORY AMTEST COPY TO: MACK WHITSON RECEIVED BY: (SIGNATURE) PINK - COPY TO COORDINATOR RELD FILES DATE/TIME 1/84 1300 SAMPLE DESCRIPTION (0, 1.8-1.1 0 RELINQUISHED BY (SIGNATURE) ATTACHMENT D SDWA · . □ NPOES DATE/TIME NUMBER OF CONTÂINERS SAMPLING PROGRAM YELLOW -, CLIENT $\overline{\mathbf{x}}$ X ₹ メ X × < 1.27° RCRA RELINQUISHED BY: (SIGNATURE) OTHER SW-846 **ANALYSES REQUESTED** U: (SPECIPY) 17/4/84 क्रांड . DATE/TIME DUPS DBUS DFED-EX SAMPLE SHIPPED VIA DATE/TIME RECEIVED BY: (SIGNATURE) لون. دکا zί 7 500 ml poly (Area RECEIVED BY LAB: (SIGNATURE) 305 Š PROJ * ₩ # DATE INVOICED DISPOSITION: D NO. OF SAMPLES GLASS JAZ FOR LAB USE ONLY AIR BUS BILL NUMBER REMARKS VERIFED M.V. g REV. 6/87 FORM 340 ٠ DATE/TIME DATE/TIME

	. 100	\
	115	,
CHA		٠
-		- 7
		~
		. L

CHAIN OF CUSTODY RECORD



PROJECT NU	IMREK	- '	PRO	JEC	NAME							:	1				AN	ALYSE	S REG	UESTE	D	•			1		F	OR L	AB (JSE O	NLY		
5842766	4.46	1	رم ک	N/A	.c7L	51	3146	٤.	PAG	<u></u>	:			Ţ	1	1				χ.							-:						
CLIENT NAM		_] * 2		6,4								:.	100		B# _ OJ#	_						
REPORT TO:	_				· · ·	CC	PY TO:	:			;	. 1 1 2	CONTAINERS					17							ے ا	ж		٠,		. Verifii	ED :		
	UE HA					_	MA	11	WA	4, 73	101	<u> </u>	ᆛᄫ		S				'											. VERII	.U		
REQUESTED (E		•	i i	BORATO								13							Ì	İ			TE INV							
	CONFII 4c	<i>~</i>					9MT	ES			, 4 _V ,		၂ ဇ္ဇ	2	3		1	. 6	1.				ŀ		NC	O. OF S	AMP	LES _		p	9	of	
STA 15	89			GRAB	•						ri.		NUMBER	1	3	,						ĺ.,			DIS	POSIT	ION:	D	R _			DATE	
	DATE TIM	E {	3	5			SAN	APLE I	DESCI	RIPTIC	NC		3	6	1					:			:-		 		_		REM/	ARKS		DAIL	
504 11	4 16	0/	K				ء ح					.13	1	x				<u>\$</u>						::.	8	02 (Sig	55	TAL				
514	16.	20 1	!		RP	\$ -	53	4	-6	7 -	· 🛆	1. 1	11	X	<u> :</u>	1 1 1										1	<u> </u>	1:					
5650 V	12	> X			Ris	_	50	52) —(٥.	-/5	¥2.	į	K		1	ي ا	ν'.		1			ŀ	24	:2.Q	1	$\langle \hat{\gamma} \rangle$	1.3					
(cw1 11)	30 14	15 x		•			CL					- 1	1	X	1		3	(S)			差				3 .t.	Ş		133	T				
EW2 11/3	10 153	o X	!		PPS		6 0	- (حد	s s	- 🥳		1	7		, i	,	, CE					7 _{N10}	Ĝ. B	<u> </u>	(3)		1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00		, g*\	, X	5	
(w3 11/3	36 /62	OK	(RPS	- (Cu	- 6	<u>/</u> w	3	7	A Mariana Regular	1	K	.;(,)	33.				Y		i	30.3	2	11.		1 2				
SBH 121	116, 094	5)	y		PPS	_	۷٠-	58	5)I -	BF	5-1C)	1.0	χ	7,	3.5	Y.			100				4.4	W. 9			(1) (1)			3.4	F. Carlo	Ŧ .
\$12 12/1	103	5 h	(, .	RS	- 0	υ -	SB	12	- Ġ	_ی	:/0	1	X				27		3 (f)	i şi				2 47	43	V. 7	14	×				
5313 12	/1 121	5 x	1		RZS	- (u-	51	313.	- 13	3 - 10	1.5		X	3	Ç	· ·		1	, ,				10 m		Ç		7					
535 12/	1. 122	5 X	•		RPS	- ;	505	-(0 -	. / ')		;	K	1,0		ية. ا	3	,			:	: .	7	, j	1 77					, Y		
535- 14		OK	:]		RPS	5 –	513 5	/	Ø-	2	• 1		1	K	7.		्य स्था र							. 🚓									
(cwy 12)		S ×	:		RPS	5-6	cu.	. 'c	w	4				×				1														•	
SB14 12/	141	- X			RPS	-(V		3B14	4 -	85	-10	/	×		د		ii v					į		. ,	·,		$\perp \!\!\! \perp$., .		,	`	
Cw5 12/	1 151	OX			RPS	- (ju .	- (c w	5		3 D	1	X	1,50	.12 V		.:: :2	Ė	ν.	•				1	,	,	\perp		• •			
CP5 121	1. 154	<u>ی X</u>			RPS	-	MC	- (CP5		BLA	WL	2	<u> </u>	X	? ;								_	20	n 40	بمأد	المل	iÁ	<u> </u>	٠.		
SAMPLED BY	AND TILE	IGNAT	URE	:)			DATE	/TIME	E	REL	INONI	SHED BY (SIGN	ATURE)	10.72	1 %	ii.	D	ATE/III	ME	R	ECEM	ED BY	/: (SIG	NATUR	RE)			:	. [DATE/TIM	1E
VILI	1 Sent	55)	1/2	1/94	18	ω	2	[//L		<u> </u>	XI	÷11.		1 / N	当/	44/	35 0	915	3				1 1										
RELINQUISHE	RELINQUISHED BY: (SIGNATURE) DATE							ENED	BY: (S	SIGN	ATURE) "	ATE/TI	ΜĘ	RE	UNO	UISHE	D BY:	(siGi	VATUR	E)	, DA	TE/TIN	1E	REC	EMED				ATURE)	, [DATE/TIM	!E
4	<u> </u>						5						Ž.	448	6		idan Idan					2/			1	95				en	12/9	ATE/TIM	3
REMARKS _4	M EV	1	Dre	14.1		-	SDWA		SA IPDES		NG PI			HER .	SW-	846		Πu	PS [BUS		ED-EX		AIR BI	US BII	LMUM	BER						

5811 53/3 5314 5312 CLIENT NAME ROLLSING REMARKS RELINQUISHED BY: (SIGNATURE) SAMPLED BY AND TIFLE (SIGNATURE) REQUESTED COMPLETION DATE REPORT TO: PROJECT NUMBER Øt.18927 645 N S 205 154 CONTRACT 12/ 1889 DATE Sicc HAYS 0 2450 B CHAIN OF CUSTODY RECORD 21112 luzo Shel 1215 1035 1605 NE NE RHUNC 086 THO ズ ス $\overline{\mathsf{X}}$ ス X PROJECT NAME COMP Comeris Burne GRAB (Jose) DATE/TIME Ris-cu-Saly-8,5-10 25 RPS-Cu-S013-13-14,5 RPS-Cu-Soll-8.5-10! -S-07 RPS-Ca -SB12-8,5-10' RPS -STON 161 なって 45 LABORATORY COPY TO: General - 2 Z AMRST MARK Ś RECEIVED BY: (SIGNATURE) 1/1/87 1800 SAMPLE DESCRIPTION ı CES CPS CAS COH, SOL N RELINQUISHED BY (SIGNATURE □ \$P :5 **NPDES** DATE/TIME NUMBER OF CONTAINERS SAMPLING PROGRAM AETTOM - CREMIT TO A STORY OF THE STATE OF T RCRA OTHER SW-846 RELINQUISHED BY: (SIGNATURE) 7 - 1 31 - 152 À.1. X X ARCHIUS X €4. X ... [4] ANALYSES REQUESTED 7. Stell 101 ٠, (SPECIFY) PATE/TIME 2450 ij. DATE/TIME . SAMPLE SHIPPED VIA HAND OTHER ☐ UPS ☐ BUS ☐ FED-EX رن 🔾 RECEIVED BY: (SIGNATURE) 94 200 802 GLASS JAZ 8026455 RECEIVED BY LAB: (SIGNATURE) Š Sooul Pory PROJ # ¥ 8 DISPOSITION: D DATE INVOICED (5) NO. OF SAMPLES ce, YOM! UIALS ۴ FOR LAB USE ONLY AIR BUS BILL NUMBER REMARKS VERIFIED 8 8 REV. 6/87 FORM 340 Just 1 DATE/TIME DATE/TIME M

**** * ^ ^ ^ ANDANIES SHIPMENT PINK — COPY TO COORDINATOR HELD FILES

ATTACHMENT 4

PHONE CONVERSATION LOG SHEET

TO: 1 E. Hays DATE: 11/8/89
From: D. Lundstron TIME: 5:30 AM/PM
of INDOE SUBJECT: Closure
REMARKS:
I asked Dave if he had any objection to
our play to begin to steam dean the RCRA
I asked Dave if he had any objection to our plan to begin to steam clean the RCRA Storage area the week of nov. 27 be said that
was five. It would like to come and to coverie
sant of the time as a learning experience
He is preparing a letter to us stating that
there were no comment of the Public notice
and that the ear begin implementing the
Closure Plan.
11/15/19 Called Danto suring him about
the beginning of cleaning the week of now 27.
He said fine. He will not be six about the
thus now It the letter to use is in the med.
He seed it to me.
11/21/89 Dave Limitation justed site. Lather about where sample were to be taken. He felt Things
about where sample were to be taken. He felt longs
Goobed fine.

PRONE CONVERSATION LOG SHEET

To: <u>Dave Lundstrom</u> DATE: 1/30/89	
From: AM / PM	
of WDOE SUBJECT: Closure Plaw	_
Deviations	
REMARKS:	
I called Dave to let him know how the closure	· ——
activities were progressing. It is going dower	
than outicipated due to the extra time required t	0
pressure wash the coment pad but we should be finis	
by Friday. We made a couple of changes from the	
closure plan, but nothing substantial, only minor	
deviations. 1) In the holes at the perimeter of the	-
storage area, we found water at about one foot. (ive,	_
therefore, that our samples of soil at one foot rath	CIT.
than at one and two feet. 2) we may use a	_
chivel in addition to a drill for taking concrete	_
samples, since it is difficult to get enough sample	<u>د</u>
using a drill. Also, some of the drills for masona	
look like they may contain some copper.	, . -
Dave felt that these changes were fine, but aske	<u>id</u>
that we be sure to document them in the report.	_
· · · · · · · · · · · · · · · · · · ·	-
	_

RHÔNE POULENC INC. FINE ORGANICS DIVISION

SEATTLE, WASHINGTON PLANT 9229 E. Marginal Way South - P.O. Box 80963 - Seattle, Washington 98108 - Telephone (206) 764-4450

December 28, 1990

Certified Mail Return Receipt Requested

Mr. David L. Lundstrom
Hazardous Waste Inspector
Hazardous Waste Section
Washington Department of Ecology
4350 150th Avenue, N.E.
Redmond, WA 98052-5301

Subject: TSD Facility Closure

Dear Mr. Lundstrom:

Since our April meeting with you and Byung Maeng, Rhone-Poulenc has, at your request, collected additional soil samples east, north, and west of the storage area. (See attached Figure.) These samples were collected at depths of six, fifteen, and twenty-four inches. At two locations, samples were collected at thirty-six inches below ground surface. Based on these data, copper levels were found to be quite variable. Some concentrations are higher and some are lower than the 32 ppm criterion specified in the Closure Plan (i.e., In of concentration of copper in soil samples equal to or less than the In of the mean of the copper concentrations of the background samples plus four standard deviations.) None of the samples from east of the storage area were found to be above 32 ppm.

Based on familiarity with activities conducted at the RCRA Interim Status storage area, it seems inconsistent that the copper values found in the soil are a result of waste management practices at the storage area. Regular inspections of the storage unit (monthly, from 1981 to mid-1986 and, daily, from mid-1986 to the cessation of waste storage) indicate only minor incidents (of much less than reportable quantities) which were remediated shortly after they occurred. These included small amounts of solid material spilling on top of the concrete walls and, in a few cases, ending up on the ground near the wall. When this happened, the material was removed from the wall, shovelled from the ground, and placed back in the storage unit. Also, no cracks were found in the concrete structure during the thorough inspection and sampling following the cleaning of the concrete pad and walls in November of 1989 which would have allowed copper-containing material to reach the soil. Another reason for concluding that the copper found in the soil is not from activities at the storage unit is that no gradient of concentrations was found around the unit (i.e., higher values close to the unit and lower values as the distance from the unit increases).



Please consider this letter as supplemental to Rhone-Poulenc's letter of April 10, 1990 (attached). The information in that letter concerning the appropriateness of the choice of background as a cleanup criterion is still very pertinent. Since that letter was written, the Department of Ecology has published a more recent draft of the Model Toxics Control Act Cleanup Regulations and has eliminated the cleanup standard for copper in soil at industrial sites. This lends support to our position that the removal of soil containing the copper levels which we are finding is not warranted in order to prevent harm to human health or the environment. since the April letter, the EPA, in the preamble to their Proposed Rule for Corrective Action for Solid Waste Management Units at Hazardous Waste Management Facilities has discouraged the use of background in cases which are similar in some ways to our TSD unit This portion of the preamble follows: closure.

"The Agency also examined alternative approaches for setting action levels. One alternative would have required a Corrective Measure Study whenever background levels of contaminants were exceeded. Experience in the subpart F program has demonstrated that the determination of background levels can be a lengthy, controversial process. Furthermore, background levels will often be much lower than health-based levels. Thus, this alternative was rejected, since it might delay the initiation of the CMS and ultimate cleanup, and might often require Corrective Measure Studies even where levels were significantly below health and environmental-based standards."

Based on all available information, Rhone-Poulenc feels that the storage unit has not adversely impacted the area outside the unit and that the variable copper concentrations found in the soil do not present a threat to human health or the environment. Further, based on the attached data, Rhone-Poulenc feels that the use of copper background levels as a cleanup standard is not appropriate and should be replaced with as alternate standard.

Rhone-Poulenc would appreciate the opportunity to meet with you at your earliest convenience in order to come to an agreement concerning the closure of our Interim Status storage area. I will call you in a few days to schedule a meeting.

Sincerely,

Sue E. Hays

Luc E. Hays

Governmental Affairs Superintendent

Attachments

bcc: R. Axelrod

C. Berry

T. Butler

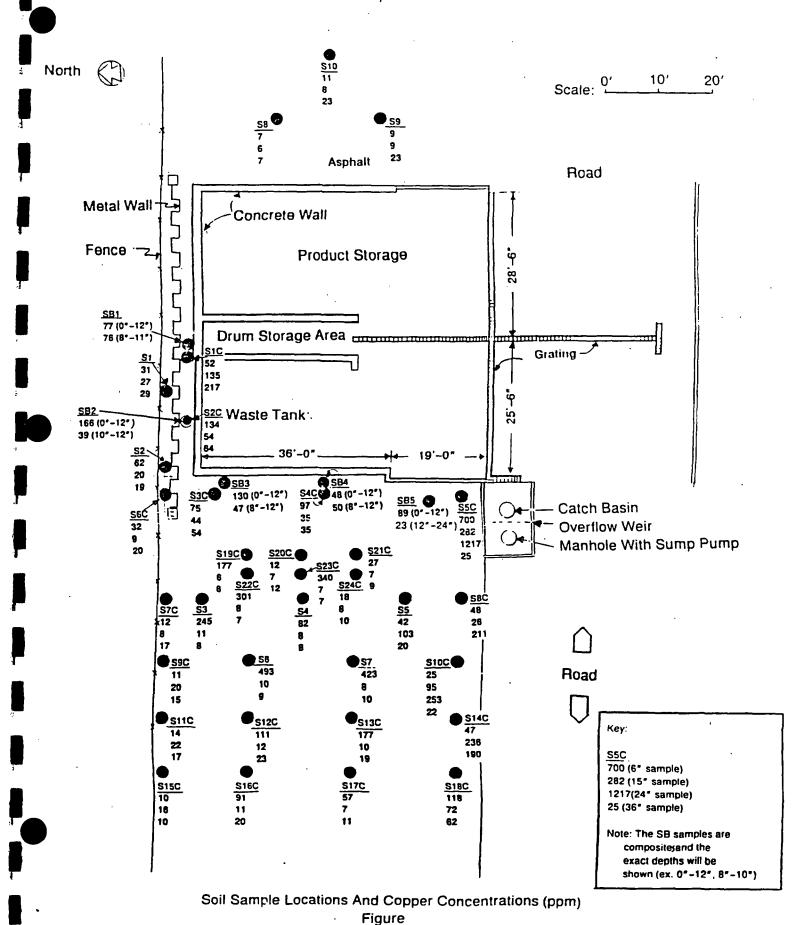
M. Duffy

W. Farran

G. Podrabsky

M. Whitson

RCRA STORAGE AREA RHONE-POULENC INC. SEATTLE, WASHINGTON 98108



RHÔNE-POULENC INC. DRGANIC CHEMICALS DIVISION

9229 E. Marginal Way South - P.O. Box 80963 - Seattle, Washington 98108 - Telephone: (206) 764-4450

April 10, 1990

Mr. David Lundstrom
Hazardous Waste Inspector
Hazardous Waste Section
Department of Ecology
4350 150th Avenue Northeast
Redmond, Washington 98052

Subject:

Request for Closure Plan Amendment

Dear Mr. Lundstrom:

The purpose of this letter is to request permission to amend the Closure Plan (approved November 8, 1989) for Rhone-Poulenc's interim status storage facility. During closure activities in December, we encountered unexpected concentrations of copper in the soils near the storage facility. We believe this copper is not derived from the strainer solids that were stored in the waste tank. Consequently, we have re-evaluated the appropriateness of using background levels as a cleanup standard, and we have conducted further research on regulatory cleanup levels for copper. As result of this additional work, we are proposing to revise the soil cleanup level for copper in the Closure Plan. It is important to recognize that the proposed revised soil cleanup level for copper would still meet the closure performance standard (40 CFR 265.111) by being protective of human health and the environment. Specific information regarding this proposed amendment to the Closure Plan is provided below.

Background

A Closure Plan was prepared for the Rhone-Poulenc interim status storage facility in August 1986. This Closure Plan was amended in August 1988 and July 1989. The July 1989 amendment included specific cleanup levels for soil and concrete in order for the storage facility to achieve "clean" closure (protection of human health and the environment and no post-closure requirements). The soil cleanup level for copper included in the July 1989 amendment was background soil copper concentrations (the mean concentration of several samples plus four standard





Mr. David Lundstrom Page 2 April 10, 1990

deviations). An area at the plant site was selected for soil background based on the following:

- The area was far removed from the storage facility.
- The area did not appear to be affected by facility activities.
- The area appeared to be upgradient.

The following activities were not conducted prior to selecting the soil background area:

- A geologic study to compare the soil strata at the storage facility to the soil strata at the background area.
- A historical review of the site development to estimate portions of the site that are native upland soil; the portions that are previous natural riverbed of the Duwamish River; and the portions that are fill material, as well as the source and type of the fill material in the latter case.
- A review of offsite activities that may have affected onsite soils.

Sampling of soil at the storage facility and at the background area was conducted in December 1989 during closure activities. Soil sample locations at the storage facility are shown in Figure 1. The location of the soil background area is shown in Figure 2. The soil sampling results from the storage facility and background area are summarized in Tables 1 and 2, respectively (other sampling results are presented in Tables 3 through 6). The copper concentrations in all of the perimeter soil samples of storage facility except one exceeded the copper concentrations of the preliminary background samples (the mean concentration plus four standard deviations). However, based on our knowledge of the management of strainer solids at the storage facility, these concentrations were unexpected, and we do not believe the copper is necessarily derived from the strainer solids.

Reviews of Appropriateness of Using Soil Background Levels

Because of the unexpected concentrations of copper in the soil, we reviewed the appropriateness of using the soil background level as a cleanup standard for our site-specific closure activities. Our review concluded the following:



Mr. David Lundstrom Page 3 April 10, 1990

- The concentration of naturally occurring metals in soils is highly variable. A common range of copper concentrations for soils is 2 to 100 ppm (Lindsay, W., 1979).
- The Rhone-Poulenc site is likely comprised of a combination of native upland soil, previous natural riverbed of the Duwamish River, and imported fill material (the source(s) of the imported fill material is not known and may be highly variable). An extensive historical review has not been conducted because it is expected there would be limited information; therefore, the results of such a review would be minimal and of limited usefulness. The soils at different locations on the Rhone-Poulenc site are likely to be from different sources which could significantly increase the variability of copper concentrations in the soils at the site.

The sources of the copper in the soil near the storage facility cannot be determined from available information, and it is unlikely that the source can be determined by further investigation. We have considered analyzing for another indicator constituent of the strainer solids without success. There does not appear to be another indicator as satisfactory as copper in this situation, which is why we originally selected copper.

EPA has stated the following regarding the applicability of cleanup of constituents that are not from the HWMU (53 Federal Register 9944):

It is the Agency's policy that in order to achieve clean closure of a hazardous waste management unit, the owner or operator must remove only those hazardous wastes or waste residues that are in the unit or have migrated from it, as shown by the factual circumstances in each case.

Based on our knowledge of the management of the strainer solids at the storage facility, we believe the copper is not derived from the strainer solids. We believe the copper is either naturally occurring or is from other activities. Because the copper may be naturally occurring or from other activities, and because the site soils appear to be heterogenous (native material and imported fill) and there is a high variability of copper in soils, the use of a soil background cleanup level is not appropriate. There are other regulatory levels for copper that are more appropriate and that are protective of human health and the environment.

Mr. David Lundstrom Page 4 April 10, 1990

Regulatory Copper Levels

We have checked several sources for regulatory levels for copper. There is not a soil cleanup level for copper in the Interim Final RCRA Facility Investigation (RFI) Guidance (EPA, May 1989).

Ecology recently prepared a public review draft of Cleanup Standards Amendments to Model Toxics Control Act Cleanup Regulation (Ecology, March 1990). These draft amendments have a soil cleanup level for copper of 100 mg/kg. (The cleanup level is actually listed as 500 mg/kg. However, Ecology staff have indicated the 500 mg/kg value is an error and should be 100 mg/kg.) The State of New Jersey Department of Environmental Protection uses a soil cleanup of 170 mg/kg.

Levels for copper in sediment to protect aquatic life have been developed for the management of sediment in Puget Sound. The Lowest Apparent Effects Threshold (LAET) for copper in sediment is 390 mg/kg (Read et al., June 1989). Above this value, sediments have been shown to be toxic to benthic infauna. In the Interim Sediment Quality Evaluation Process for Puget Sound (Ecology, October 1989), Ecology is using the 390 mg/kg level to define a problem area that may require remediation. If the concentration of copper in sediment is below 390 mg/kg then the sediment is not defined as a problem area and does not require remediation (unless other chemicals in the sediment exceed the LAET).

Another program for the management of sediment is the Puget Sound Dredged Disposal Analysis (PSDDA). Under the PSDDA program sediment can be disposed of at an open-water disposal site if the constituents do not exceed the screening level. The screening level for copper is 81 mg/kg, which is listed in the Phase II Management Plan Report (Ecology, et al., September 1989). The sediment can also be disposed of at an open-water disposal site if the copper concentration exceeds 81 mg/kg and is less than 810 mg/kg, if biological testing indicates that the sediment would not have an adverse effect.

A summary of the regulatory values and the soil copper concentrations at Rhone-Poulenc are shown in Figure 3.

Mr. David Lundstrom Page 5 April 10, 1990

Discussion and Recommendation

The mean and median concentrations of copper in the soil at the Rhone-Poulenc storage facility are below all of the regulatory values we have been able to locate for copper levels in soil and sediment. These regulatory values are intended to protect human health and the environment. A good example of this is the sediment disposal standards. If dredged sediment does not exceed 81 mg/kg of copper, it can be disposed of directly in the water, unconfined, at an open-water disposal site in Puget Sound without any further testing (unless there is reason to believe the sediment is highly anomalous). If in situ sediment in Puget Sound does not exceed 390 mg/kg of copper, it is not considered to be part of a problem area that may require remediation.

Based on these regulatory values, we believe that leaving the soil in place (with the current copper levels) is fully protective of human health and the environment. We recommend a soil cleanup of 390 mg/kg of copper because the Interim Sediment Quality Evaluation Process for Puget Sound currently allows sediment with this level of copper to remain in place directly in the water without requiring any remediation or any further testing.

We look forward to discussing the data and recommendations with you during our meeting on Thursday.

Sincerely,

Sue E. Hays

Luc E. Hays

Governmental Affairs Superintendent

Table 1

SOIL SAMPLE RESULTS FOR COPPER AT PERIMETER OF

WASTE TANK AND DRUM STORAGE AREA

SOIL BORING NO.	SAMPLE <u>DEPTH</u>	SAMPLE RESULTS (Mg/Kg of Copper)	Ln OF SAMPLE RESULTS	BACKGROUND (Mean Plus 4 std. Dev.)
/ SB-1	0-1'	76.8	4.34	3.46
	.7191	76.4	4.34	
\int_{SB-2}	0-1'	166	5.11	
	.8'-1.1'	38.8	3.66	
✓ SB-3	0-1'	130	4.87	
	.7'-1'	46.7	3.84	
√SB-4	0-1'	48.1	3.87	
	.7'-1'	50.0	3.91	•
	0-1'	53.2ª	3.97	
		73.6 ^b	4.30	
√ SB-5	0-1'	88.6	4.48	
	1'-2'	23.2	3.14	
Mean		75		
Median		67		

a Field Duplicate

b Laboratory Duplicate

Table 2

BACKGROUND SOIL SAMPLE RESULTS FOR COPPER

SOIL BORING NO.	SAMPLE <u>DEPTH</u>	SAMPLE RESULTS (Mg/Kg of Copper)	Ln OF SAMPLE RESULTS
✓ SB-6	0.5'-1.5'	13.8	2.62
√SB-7	0.5'-1.5'	21.4	3.06
√sB-8	0.5'-1.5'	18.7	2.93
√SB-9	0.5'-1.5'	19.5	2.97
1(SE =1)	0.5'-1.5'	15.7ª	2.75
✓ SB-10	0.5'-1.5'	17.0	2.83
		17.5 ^b	2.86
Mean			2.86
Standard De	eviation		0.15
Mean plus 4	Std. Dev.		3.46

a Field Duplicate

b Laboratory Duplicate

Table 3

SOIL SAMPLE RESULTS FOR COPPER AT ABANDONED SUMP AT

WASTE TANK AND DRUM STORAGE AREA

SOIL BORING NO.		MPLE RESULTS	Ln OF SAMPLE RESULTS	BACKGROUND (Mean Plus 4 Std. Dev.)
/SB-11	8.5'-10.0'	22.3	3.10	3.46
√SB-12	8.5'-10.0'	23.3	3.15	
∨ SB-13	13'-14.5'	13.4	2.60	
SB-14	8.5'-10.0'	11.5	2.44	

Table 4

CONCRETE SAMPLE RESULTS FOR COPPER AT WASTE TANK

LE NO.	SAMPLE RESULTS (Mg/Kg of Copper)	Ln OF RESULTS	BACKGROUND (Mean plus 4 Std. Dev.)
-1	220	5.39	8.50
····2	390	5.97	8.50
	323ª	5.78	8.50
-3	145	4.98	8.50

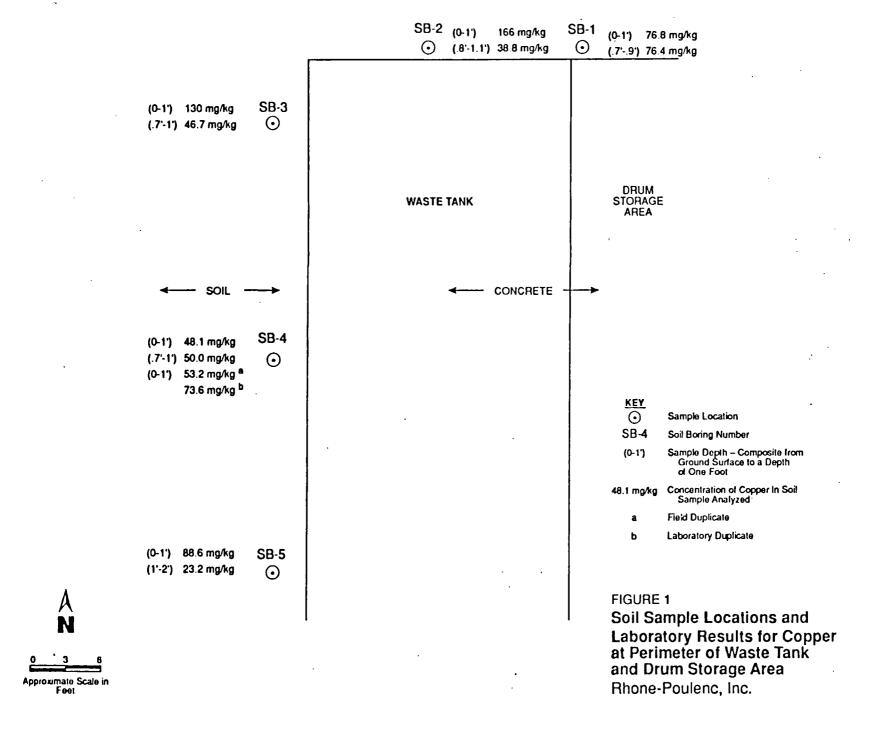
oratory Duplicate

Table 6

SAMPLE RESULTS FOR METHYLENE CHLORIDE

AT DRUM STORAGE AREA

SAMPLE	RESULTS	CLEANUP LEVEL
RPS-MC-CP5 (Concrete Pad)	125 μg/kg	500 μg/kg
RPS-MC-CP5 (Blank)	160 μg/l	
Trip Blank	160 μg/l	
Lab Blank	165 μg/l	



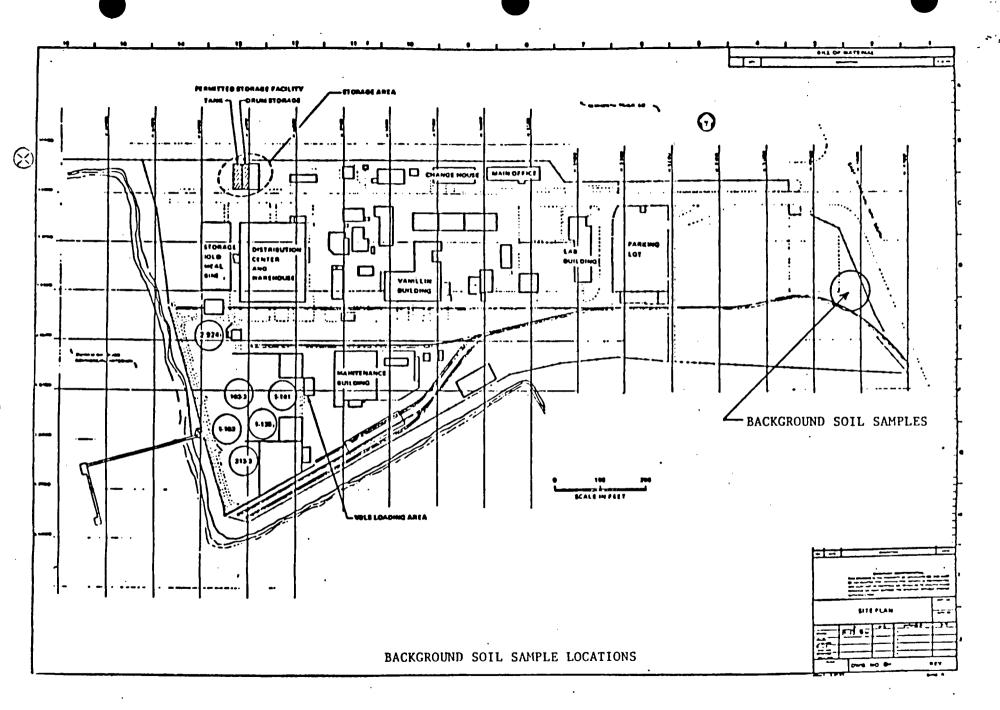


Figure 2

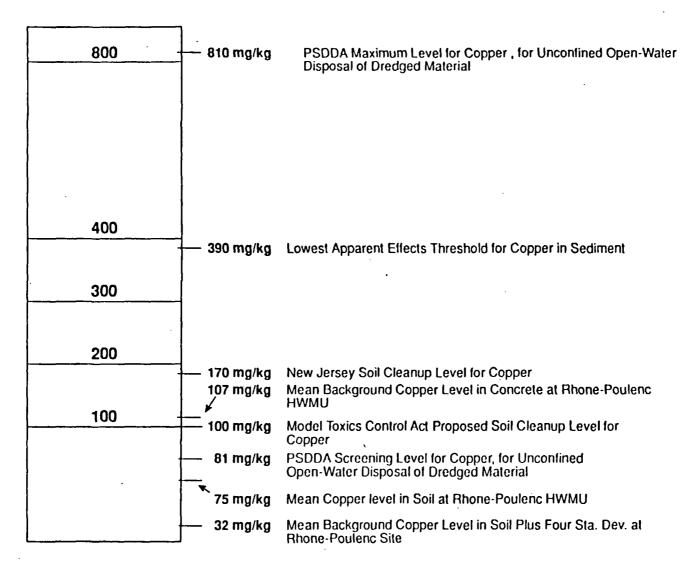


FIGURE 3
Comparison of Copper Regulatory Levels with Copper Levels in Soil
Rhone-Poulenc, Inc.

CHRISTINE O GREGOIRE Director



RECEIVED

APR 1 1 1991

RHONE POULENC SEATTLE PLANT

4350-150th Ave. N.E. • Rednighd, Washington, 98052-5301

(206) 867-7000 -

April 8 1991

Cc: C.S. Beiry BHL R. Axelrod -CH2M HILL

Ms. Sue E. Hays Governmental Affairs Superintendent Rhone-Poulenc, Inc. 9229 E. Marginal Way South P.O.Box 80963 Seattle, Washington 98108

Re: Closure Plan Amendment for Final Closure of Interim Status Storage Unit at the Rhone Poulenc, Inc., Seattle Facility

Dear Ms. Hays:

This letter is in response to the Rhone-Poulenc, Inc.'s (RPI) letter dated March 22, 1991, regarding approval of the closure plan amendment for the final closure of the interim status storage unit at the RPI, Seattle facility.

The Washington State Department of Ecology (Ecology) approves the amendment of the closure plan as described below:

- The closure performance standard for copper is 100 mg/kg.
- 2) RPI will excavate soils above the 100 mg/kg standard based on the lateral and vertical extent of copper in soil as presented in the December 28, 1990 letter to Ecology.

No further soil sampling will be required after the excavation of the copper contaminated soils if the excavation is done in the proper manner as described above. The backfill material must contain less than 100 mg/kg of copper.

Ms. Sue E. Hays April 8, 1991 Page 2

Please notify me when the soil excavation is going to be done so I can be present. If you have any questions, feel free to call me at 867-7253. I appreciate your cooperation on this matter.

Sincerely,

Bongonang

Byung Maeng, P.E. Environmental Engineer

cc: Julie Sellick, Ecology - NWRO
Hideo Fujita, Ecology - NWRO
Dave Lundstrom, Ecology - NWRO

SOIL EXCAVATION PLAN

1.0 INTRODUCTION

1.1 Purpose and Scope

This plan describes soil excavation and backfilling to be conducted adjacent to a RCRA interim status storage unit at the Rhone Poulenc, Inc. (RPI) facility in Seattle, Washington. These activities are being performed in accordance with RPI's closure plan approved by the Washington State Department of Ecology (Ecology). The tasks contained in this plan are the remaining known field activities necessary to accomplish final closure of this RCRA storage unit.

1.2 Background

In November 1989, RPI implemented closure activities at their RCRA interim status storage facility. As part of the closure activities, soil and concrete sampling was performed in and around the storage unit; and copper, above a revised closure performance standard of 100 ppm, was found in some soil samples to the west and immediate northwest of the unit. Correspondence regarding this revised performance standard and the requirements for completion of closure are contained in an Attachment to the closure certification report.

In order to complete closure, Ecology has determined that it is necessary to remove soils around the storage unit that contain copper concentrations above the 100 ppm performance standard. Based on the soil data collected, RPI and Ecology have agreed to remove approximately 200 yards of soil at depths ranging from one to three feet, as shown in Figure 1. The soil excavation areas will be backfilled with clean (i.e. copper concentration less than 100 ppm), non-structural, granular material to present grade.

2.0 SOIL EXCAVATION ACTIVITY

2.1 Excavation Areas

The aerial extent and depth of soil to be excavated and removed from the site is shown in Figure 1. A cross-section from west to east across the site through the southern portion of the excavation is shown in Figure 2. The area and depth of the excavation are delineated based on soil sampling and chemical analyses previously conducted. The soil sample locations, sample depths, and copper concentrations (in ppm) found in the soil samples are

1 of 4 6/27/91

shown in Figure 3. The aerial extent and depth of the soil excavation is based on the revised closure performance standard for copper in soil that was established by Ecology at 100 ppm.

The majority of the area to be excavated lies directly west of the storage structure. This area is open, uncovered, flat, and gravel covered. A narrow strip of soil will also be excavated along (i.e., outside of) the northwest corner of the storage unit, and under a roof covered portion of the storage unit. This narrow strip of soil will be excavated between the north concrete wall of the unit and the steel wall which is integral with the roof.

The RCRA storage unit is constructed of concrete and consists of a floor slab with approximately five-foot walls around the west, north and east sides. The unit has no wall on its south side and it is sheltered by a steel roof. The roof straddles the storage area approximately 20 feet above the floor of the structure and is supported by steel columns founded on isolated concrete footings. On the north side of the unit there is a steel wall integral with the roof columns. This steel wall extends from ground level to the roof line and provides shelter at the north side of the storage unit. The steel wall is located approximately three feet north of the concrete wall of the storage unit.

2.2 Excavation Quantities and Materials

The excavation covers approximately 2910 square feet of surface area. Excavation of the materials will result in the removal of approximately 200 cubic yards of soil. Descriptions of soil samples from previous soil analytical studies indicate that the material to be removed consists primarily of sand and gravelly sand.

2.3 Excavation Methods and Procedures

The contractor will provide the equipment and labor to accomplish the soil excavation and backfill operations described in this plan. The excavation of the contaminated soil to the west of the storage area will be performed with a backhoe and/or front-end loader and shovels. The excavation of soil forming the narrow strip along the northwest side of the storage unit will be accomplished manually with shovels.

The outlines of the excavation will be marked in the field on the ground as indicated by the dimensions shown on Figure 1. The excavation process will begin at the northern edge of the area and work progressively to the south in east to west-trending strips, or as otherwise agreed to with CH2M HILL prior to the implementation of excavation activity. The finished depths of the excavation will be as shown in Figure 1. Periodic surveys will be conducted by the contractor from a stationary datum during the excavation activity to ensure that soils are being removed to the proper elevation.

All excavated materials will be transferred directly into disposal trucks provided by the contractor. No materials will be stock piled at the site. Using a north to south staging of the excavation equipment, the contractor will not be allowed to cross finished portions of the excavation with contaminated equipment while still exhuming and transferring contaminated soil to the disposal trucks. In addition, while accomplishing the excavation and disposal of soil into the trucks, the excavation equipment operators will not traverse any soil area outside of the marked area known to be contaminated.

Trucks and trailers used to haul the excavated soil to the off-site disposal facility will be loaded on the paved roadway along the southern portion of the excavation. A suitable impervious plastic liner will be used in the bed of the disposal trucks and trailers. A suitable plastic liner will also be placed on the asphalt pavement in the area where the trucks are loaded to prevent soil materials accidently spilled during the loading process from coming in contact with the pavement. If soil is spilled during the loading process onto the liner and/or the exterior surfaces of the truck or trailer, these soils will be contained and placed in the disposal truck before leaving the area. The plastic liner in the truck loading area will be replaced at least on a daily basis to ensure its integrity. Care will be taken at all times to prevent spread of soil contaminated with copper to the adjacent clean areas of the site. The excavation activity is expected to take no longer than three days.

Although the excavation and backfill of the contaminated area is expected to take place in the late summer or early fall, which is typically the drier part of the year, contingencies will be made for completing the excavation and backfill of the area in potentially rainy weather. Since the excavation will produce a small enclosed depression prior to backfilling, precipitation may result in surface water accumulation within the excavation. In addition, it is possible that localized perched lenses of groundwater may be encountered during excavation; however, site hydrogeologic data indicate that the excavation will be entirely above the shallow groundwater table. If surface water or groundwater accumulate within the excavation to the extent that operations are hampered, RPI and the contractor will be responsible for removing the water for temporary storage in containment structures, and for proper disposal in accordance with RPI's instructions and POTW permit.

2.4 Decontamination of Equipment

Equipment used to dig within the excavation or that otherwise comes into contact with the excavated soils will be considered contaminated and the equipment will not leave the area before it has been decontaminated by steam cleaning. A temporary steam cleaning decontamination station will be constructed by the contractor at a location identified by RPI that is next to the excavation. Plastic sheeting will be used to line the decontamination station and prevent the further spreading of contaminated soils and associated steam cleaning fluids. The plastic liner will have bermed edges and be sloped such that decontamination fluids are contained and easily transferred (as by pump) to a temporary containment

structure(s) for proper management and disposal, as instructed by RPI. At the end of the daily excavation activity, and after equipment has been steam cleaned at the conclusion of the excavation, the plastic liner from the truck loading and steam cleaning areas will be placed with the last load of soil being transported to the off-site disposal facility.

3.0 SOIL BACKFILL ACTIVITY

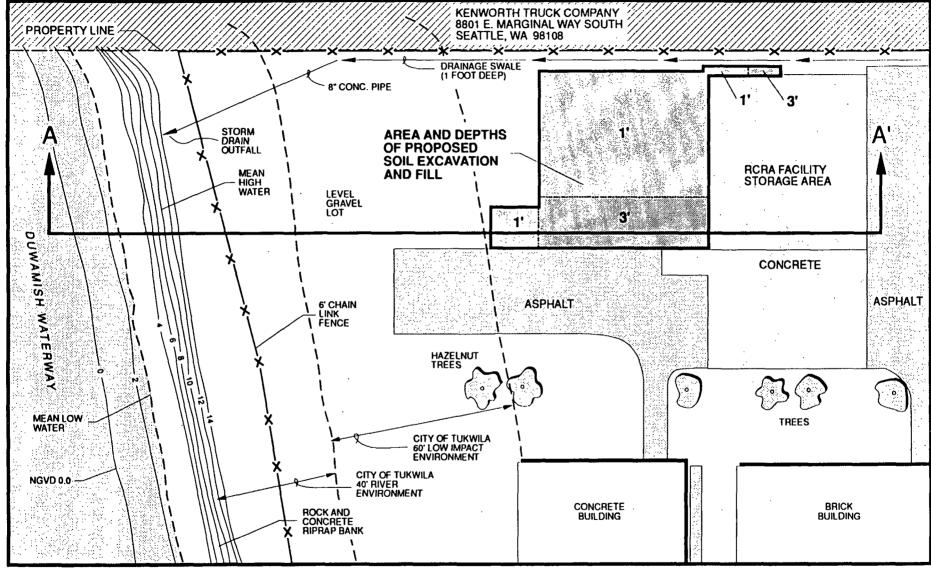
3.1 Backfill Materials and Procedures

THE CONTRACTOR WILL PROVIDE DOCUMENTATION THAT THE BACKFILL USED CONTAINS COPPER CONCENTRATIONS LESS THAN 100 PARTS PER MILLION, AND IS OTHERWISE CLEAN AND FREE OF ANY HAZARDOUS SUBSTANCES.

The excavation will be backfilled immediately upon completion of the excavation activity, provided that Ecology has observed the completed excavation or otherwise approved the excavation for backfilling. In addition, all equipment will be decontaminated prior to the implementation of backfill activities. The backfill will consist of granular pit-run or equivalent material. The material will be placed as non-engineered fill. As such, the material may be spread by truck end-dumping in the majority of the excavation. Fill placed in the narrow excavation between the wall of the storage unit and the integral roof wall will be manually placed with shovels. Enough material should be placed to restore the excavated area to present grade. In addition, the backfill will be minimally compacted over the excavation area to prevent a surface depression from developing as the fill settles with time.

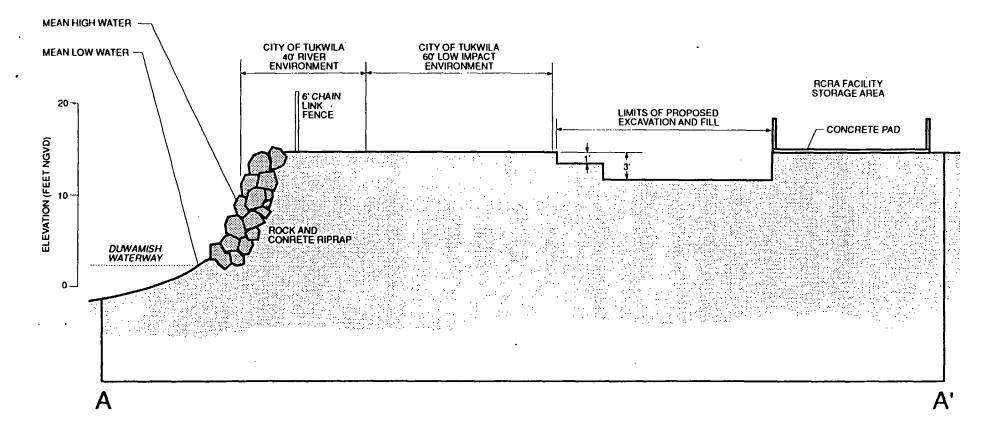
4.0 DOCUMENTATION AND REPORTING

A CH2M HILL representative will be onsite during the excavation and backfill operation to document that this excavation plan is followed. Pertinent field observations will be recorded in a bound notebook; photographs may also be collected as part of the documentation record. This excavation plan will be included as an Attachment to the Final Closure Certification Report, to be prepared by CH2M HILL after all elements of this plan are completed.



SCALE: 1" = 30' 0 15 30 NOTES: ALL ELEVATIONS RELATIVE TO NATURAL GEODETIC VERTICAL DATUM (NGVD)

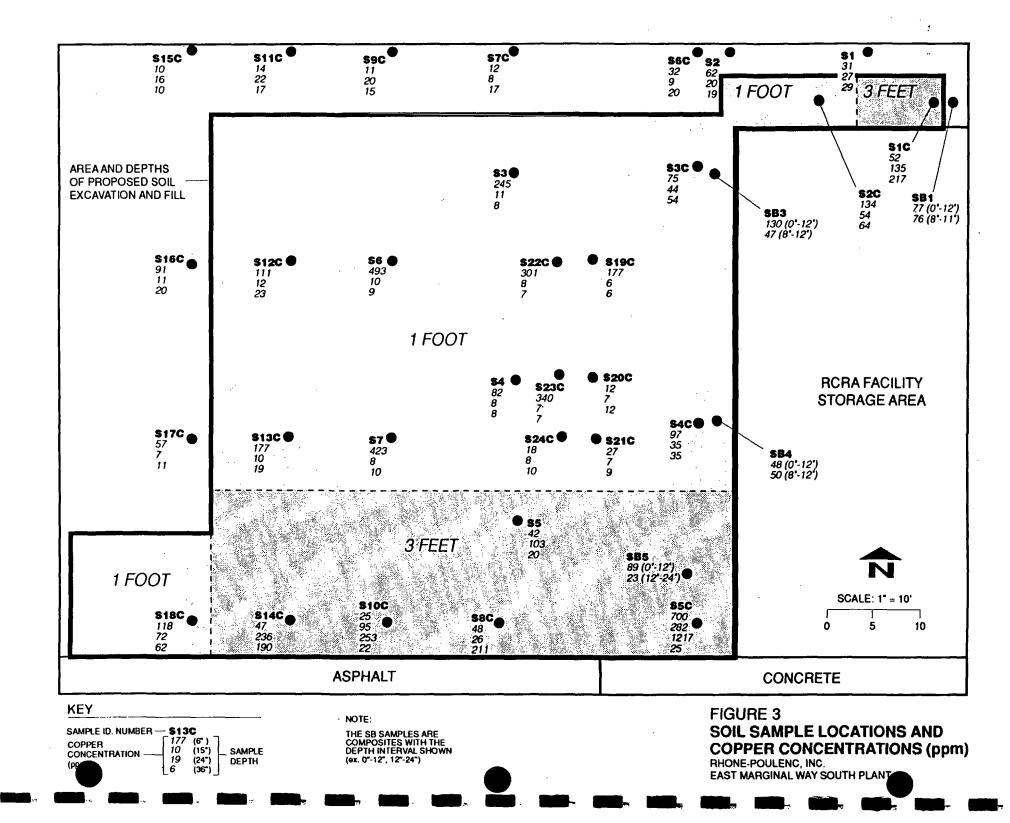
FIGURE 1
PROPOSED SOIL
EXCAVATION AND FILL AREA
RHONE-POULENC, INC.
EAST MARGINAL WAY SOUTH PLANT



SCALE: 1" = 30' (HORIZONTAL) 0 15 30

VERTICAL SCALE: 1" = 10'

FIGURE 2
CROSS-SECTION A-A'
RHONE-POULENC, INC.
EAST MARGINAL WAY SOUTH PLANT





CITY OF TUKWILA
6200 SOUTHCENTER BOULEVARD, TUKWILA, WASHINGTON 98188

JENONE # (206), 433-1800

Gary L. Van Dusen, Mayor

R. Axeirod-CHaMH:11

May 28, 1991

Sue E. Hays Governmental Affairs Superintendent Rhone-Poulenc, Inc. Fine Organics Division P.O. Box 80963 Seattle, Wa. 98108

RE: Rhone-Poulenc, Inc - 9229 East Marginal Way South
Land Altering Permit/Hauling Permit Approval

Dear Sue:

Public Works Department has reviewed and approves your submittal for the subject site. Request is the applicant apply for and is issued the following permits. Call Denise Millard, Permit Coordinator, at 431-3672 to have the following prepared for pickup:

- 1. Land Altering Permit (Permit Fee = \$55.00)
- 2. Hauling Permit (Permit Fee = \$25.00)

As part of the application the Developer's representative shall provide the following:

- Route Map (for City review and approval).
- 2. \$2,000 bond (City also named).
- 3. \$1,000,000 insurance policy (City also named).

If you have any questions regarding this matter do not hesitate to call me at 433-0179.

Sincerely,

Phil Fraser, Senior Enginer

Public Works Department

xc: Darren Wilson Greg Villanueva Permit Coordinator

Read File

Development File: Rhone-Poulenc

Enclosures (2)

PF/amc:B6:rhone

ANALYSIS REPORT

CH2M Hill

PO Box 91500 Bellevue, WA 99201

Attention: Pat O'Flaherty

Date Received: 8/14/91 Date Reported: 8/22/91

Project Name: Rhone Poulenc

Project #: SEA27664.AO

AM TEST Identification Number

Client Identification

Sampling Date

91-A006406

RP-8/12/91-TCLP

8/12/91

COMPOUND	RESULTS	DETECTION LIMIT	MAXIMUM ALLOWABLE
			CONCENTRATION

TOXIC CHARACTERISTIC LEACHING PROCEDURE (TCLP)

METALS	(mg/l)	(mg/,1)	(mg/l)
Arsenic	< 0.02	0.02	5.0
Barium	< 1	1.0	100.
Cadmium	< 0.05	0.05	1.0
Chromium	< 0.1	0.10	5.0
Lead	0.1	0.10	5.0
Mercury	< 0.001	0.001	0.2
Selenium	< 0.05	0.05	1.0
Silver	< 0.05	0.05	5.0

Reported by: Mars Osso



September 11, 1991

SEA27664.A0

Mr. Byung Maeng, P.E. Environmental Engineer Washington State Department of Ecology 3190 - 160th Avenue S.E. Bellevue, WA 98008-5452

Subject:

Regulatory Classification of Soils to be Excavated During the Closure

of the Rhone-Poulenc, Inc. RCRA Storage Unit

Dear Mr. Maeng,

This letter is a follow up to our conversation last Friday, September 6, 1991, concerning the regulatory classification of the copper containing soils at the Rhone-Poulenc, Inc. (RPI) Interim Status Storage Unit. You requested that I summarize our conversation, including the laboratory analytical results and disposal issues, for your review.

The soils that are to be excavated at the RCRA Storage Unit at the RPI Seattle facility, as described in the previously submitted closure plan. These soils were sampled and analyzed in 1991 for TCLP-metals (extraction EPA Method 1311, leachate metals analyses EPA Methods 7060, 7080, 7130, 7190, 7420, 7740, 7760), TPH (EPA Method 418.1), and fish toxicity (WAC 173-303-110). It is our understanding that you have the results of the TPH and fish toxicity from RPI in your files. The TCLP-metals analytical results indicate leachate concentrations of arsenic, barium, cadmium, chromium, mercury, selenium, and silver less than detectable levels. Lead was detected in the leachate at the detection limit of 0.1 mg/l. A copy of the TCLP laboratory report is attached for your review. The laboratory results for TPH of one soil sample indicated total concentrations of 66 mg/Kg. The Washington State acute fish toxicity test was run on three samples to determine if the copper concentrations in the soils were dangerous to fish. There were no resultant mortalities in any of the toxicity tests.

Mr. Byung Maeng Page 2 September 11, 1991 SEA27664.A0

The analytical results indicate that the soils to be excavated during the closure of the storage unit are not a Dangerous Waste. However, our client, Rhone-Poulenc, Inc., has chosen to be proactive and dispose of the excavated soils in a wellmanaged disposal facility in the State of Oregon. The selected site is the Columbia Ridge Facility operated by Oregon Waste Systems, a subsidiary of Waste Management of North America, Inc. Oregon Waste Systems is satisfied that the soils do not contain unacceptable levels of contaminants for this facility. However, because of the concern for the copper concentrations in the soils and the possibility that the soils could be considered a Washington State Dangerous Waste, Oregon Waste Systems would like a written assurance from Ecology that, based on a review of the fish toxicity bioassay results, these soils are not a Dangerous Waste. Both Oregon Waste Systems and RPI are aware that the Oregon Department of Environmental Quality (DEQ) recognizes Washington State Dangerous Waste as a fully regulated hazardous waste. DEQ will be contacted prior to the soil excavation and informed of the regulatory status of the removed soils. A letter or written statement from Ecology indicating that the data has been reviewed and Ecology does not disagree that the soils are not a Dangerous Waste would need to be available to DEQ.

RPI will inform your office in advance of the RCRA storage unit soil excavation at the RPI Seattle facility. Work will not begin until the soil disposal issues are resolved.

We appreciate your time and effort on this matter. Please contact Patt O'Flaherty or myself if you have any additional questions or concerns.

Sincerely,

CH2M HILL

Marian Allen McDermott

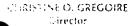
Hazardous & Toxic Waste Services Department

bia alle H. Dermott

cc: Robert Ferguson/RPI

Patt O'Flaherty/CH2M HILL

project file





STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

Northwest Regional Office, 3190 - 160th Ave S.E. • Bellevue, Washington 98008-5452 • (206) 649-7(10)

September 26, 1991

CH2M Hill

Attn.: Ms. Marian Allen McDermott P.O.Box 91500 Bellevue. WA 98009-2050

Dear Ms. McDermott:

This letter is in response to CH2M Hill's letter dated September 11, 1991, regarding regulatory classification of copper contaminated soils at the Rhone-Poulenc, Inc. (RPI) Seattle facility.

Based on a review of the fish toxicity bioassay and TCLP metals analytical results, the copper contaminated soils at the RCRA storage unit at the RPI site is not a Washington State dangerous waste. However, the Washington State Department of Ecology (Ecology) recommended the 100 mg/L of copper concentration for closure performance standard to return the land to the appearance and use of surrounding land areas to the degree possible given the nature of the previous waste activity (WAC 173-303-610(2)(a)(iii)). The closure performance standard was established based on the Washington State Ground Water Quality Standard for copper (1 mg/L) and a dilution/ attenuation factor of 100, which is currently employed by the toxicity characteristic (TC) rule. On March 22, 1991, Rhone-Poulenc agreed with the closure performance standard for copper and disposal of the copper contaminated soils.

Ecology understands that RPI will excavate and dispose of the copper contaminated soils immediately after this disposal issue between RPI and the Oregon Department of Environmental Quality is resolved. The disposal site will be the Columbia Ridge Facility operated by Oregon Waste Systems. If you have any question on this matter, please call me at 649-7253.

Sincerely,

Byung Maeng, P.E.

Environmental Engineer

cc: Julie Sellick, Ecology - NWRO
Hideo Fujita, Ecology - NWRO
Dave Lundstrom, Ecology - NWRO
Tom Post, EPA - X

TA LANDFILL, EUPLICAFT mod of itself IDAKIM 1 REWROS FOR RP. MIRKE SOID 10 OF 20 STEP OF WHILE TRUMED TAIM BURDO SEULUST AND COURTED SING TRUCK TOWER TRIVIER LONDE שישר נמנטואול LINNS TRUK DEL W NEGUTE DAMES STURBLY TENTER 557 I LEGAL STATUTE STATUTED IN STACK EXCAURATING, POST 2 DECEM DATE ST UP TRUCK BLO VISQUED ANDAT 377 AMO OF MAND CHAM (THE OWN) SITE WEATHER IS RAW, BRKHDE 12 VTHERON OM (280KME) 21/2 TO DUE 12=10 TRUCK LODDING DARKE NOT DECON ZonE part STIR BECKUS STATUS SEURSA OUTH GALLE LUN · or L BAZ WO ZENERA MAYO 5E) PIPO SINDAMA COIL BURNANTA

)is		
1294	C AT GROPEN SO	
1/5/X	و المال والمال	
	WEGHT WILL	1.

WEGGTS WILL UP GRUPEN OF ME WITH A REPORT OF THE METERN OF

842 1 ST TRUCK DIFFINANS

2 " TRUCK MOUSS 10, TO
LODD, BFM. LINNE WITH
VISQUITU

C/21 JULY TRUCK CONTRO BUD
DEPORTS SITE JOINTON FOR

932 3 RD TRUCK DRAWES 15 LINFO AND 100% 30 TRUCK GOFF TO PICK UP TRAILER 4

OLD 3 RD TRUCK BENC CUTRISTO

pulls ousid

10.43 4th TRUCK LONDON LOURS COVERD OND LONDON 40 43 5th TRUCK LIVED

Gth TRUCK WINTO MID

WAITING.

- 5th TRUCK PULLS OST

- CH TRUCK WADING

MIKE SOTS I TRUCK

IS laced bls ownerwing

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

TRUCK

T

- 7th TRUCK MANINES

THE TRUCK LITIMES
LONDON'S ENTRY
THEY SE TREFING TRUCKS

BOTHER FOR WITH

IST COVERED MUSICIPALISM COT 3712 316 ARLACOS DREHING MY 7M TRUCK AND STACKPILLED similario 1507 - majoriso THEN EPPE JUMPINGOR חמרסשסורות בנותולצ (WOMONDATI oute which which was more was Stands Japh y STUTE THAT GLASTO BYK 1200 Wooden Osphorm And Desemble Beech 3E !!

250

3175 OFF- 511E

LIUTONANTI PLACE PORKER IUSIDE माठ काग्रयन जाए MENDSIN / QUENOS उत्र दास्त रास्ता, बार गरि



ARPIUR ON SIFK For U.Re Fafe b WAST FOR NW AN FILIRO DARIORS TRICK IS SALL 2000 Ibs overlocat, NW FURD whosput scare soil By outerfret TRUR champs 1 TRUCK + TRAILIES COMB LUADAD. FYLOUXING MOTTON STOCK PILMS TO CONTROL OF FOCAUSTICN CHECK FYCOUNTY LIVES WITH VAND LENFL RESUMPL EXERUATION

PROLFSS

2 45 2 SOULTBURY SPAULS 3 45 2 SOULTBURY BUD LEAVES SUD LEAVES	230 TRULY LUMBER AND	TRUCK PARTER TO WARD,	120 CONTINUE FROMMENTE	OF FACOURION, STECK OF SITE.	10 12-10-51 (3) 12-10-51 (5)
		FND 12-10-91	45 SITTE FLOGGETO BOLKANTO APPRICA MISITE FINCOMETIC	4 10 157 TOURS DRIEMAND	345 1ST TRUK PETRULUS 1611 PRUK PETRULUS 1611 PRUK PETRULUS

A CONTRACT C

(156) 12-11-91

715 MORUR ON SITTE NO TRUCES/NO NO FURE. NW FINIDO DODING STILL WO TRUCKS UP DOZER BARIVES FOR WERFILL SPREADING DOZER OFLIGHTO IN SIRE 2 TENDER TRUCK/TESILFOS MINE R COMBS STILL UNDER MO WADING BEENS. 10 2 BUTTA TOWES /TOBAFRS DO OND GROWD

10 26 3 PP TRUER/TPOILER

11 30 NUL TOWERS ESTOMATO 12 NUL TOWERS ESTOMATO 12 NUL TOWERS ESTOMATO 12 NUL TOWERS ESTOMATOR 19 NUL TOWERS ESTOMATOR

2 DEMONIAGE OF AMILIERA OF MATERIAL GO LICAT TRUCKS

5mg 116.71

DAKETUL ARRIOFS

NO DUMPED INTO

3' ARFE OF FACAMORA

L. APPROVED FAR

BOKKFILL.

BACKFILLIUSC FRAMMEN 15 APPROUNT BY KC 70TH OF 24 TRUCK TRNER CONSUMMENUS ATMONTO

SE POURE/UPPORTURE COMPARTURE PSW 1420 WAT

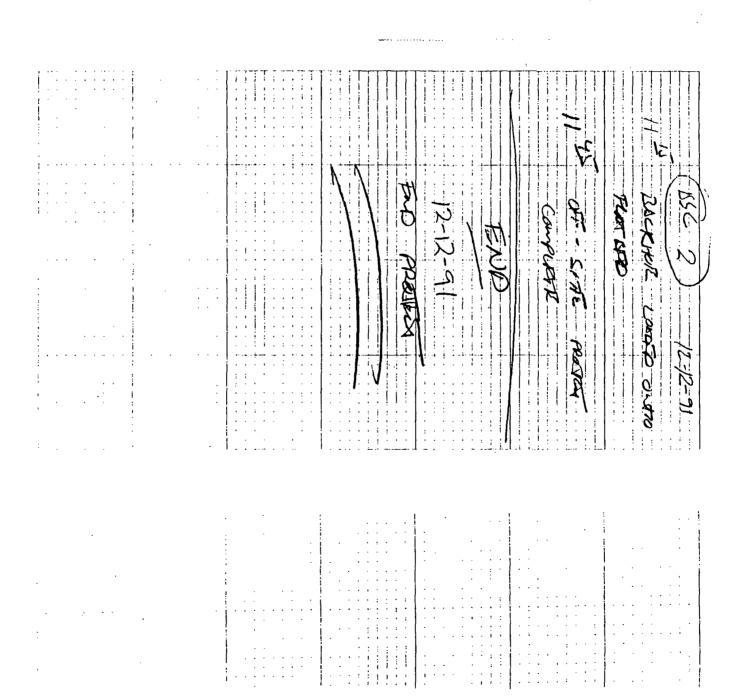
COREC JILLANUFUA CITY OF TURNILA, FILLING OF TURNILA, CUSTINUES. STILL BACKFILLINGS
14 TRUCKS IN,
ATHEROTED TO CAN.
CAPTE U. AGAIL NO.

OF TRUMS IN CPORTONING BACK-FILL

USE STAR FUNCTAS/1 LOSPA BASK HO. A ON WIS GUTTEN DOT OF PERMONDEN

END 12-11-9

BOCK HUE. Dang scapt (D) STUDGE CIPITUT Grand My Farther. TAGARAGE SAT LITTLY SU WARPING GOLDIAR IN mosts bill you are TILDHOR BESTONED Lucayed Langelly 20 enpired of excusing 2 dough spour THE BURKLAST Shuke Cushingson LAMAN MURT ZAWAY 5 208 Box 2 - 40 15-21-21





Oregon Waste Systems

A Waste Management Company

Star Route, Box 6
Arlington, OR 97812
(503) 454-2030 (Arlington)
(503) 281-2722 (Portland)

119 38217

0

DEC 12 AM 9:36

TIME:

CUSTOMER NAME:

Representations

CUSTOMER NUMBER:

TRACTOR NUMBER:

TRAILER NUMBER:

184

SEAL NUMBER:

METRO INVOICE NO.:

GROSS WEIGHT: 98480

TARE WEIGHT-TRACTOR:

TARE WEIGHT-TRAILER:

NET WEIGHT:

<u>50200</u> 48280

GATEHOUSE:

DRIVER:

TIPPER:

REMARKS:

Oregon Waste Systems

A Waste Management Company

Star Route, Box 6
Arlington, OR 97812
(503) 454-2030 (Arlington)
(503) 281-2722 (Portland)

119 58820 PM

	13 DEC 91
DATE:	Control on
TIME:	no Charlene
customer name: Sho	ne prouces
CUSTOMER NUMBER:	101
TRACTOR NUMBER:	
TRAILER NUMBER:	
SEAL NUMBER:	
METRO INVOICE NO.:	
<u></u>	+65640 35540 LB= 101,180
GROSS WEIGHT:	36540 LB- 101, 180
TARE WEIGHT-TRACTOR:	<u>53820</u>
TARE WEIGHT-TRAILER:	
NET WEÌÇHT:	47360
	2014
GATEHOUSE:	pred totriage.
DRIVER:	In fires
TIPPER:	· · · · · · · · · · · · · · · · · · ·
REMARKS: 7.W. Ene	MAO
Abolilo # 1857	3/
Traper + 100%.	

Oregon Waste Systems

A Waste Management Company

Star Route, Box 6
Arlington, OR 97812
(503) 454-2030 (Arlington)
(503) 281-2722 (Portland)

M9 38168

11 DEC 91 DATE: 03:27 PM TIME: CUSTOMER NAME: CUSTOMER NUMBER: TRACTOR NUMBER: TRAILER NUMBER: SEAL NUMBER: METRO INVOICE NO.: 64480 LB GROSS WEIGHT: TARE WEIGHT-TRACTOR: 29020 TARE WEIGHT-TRAILER: 35460 NET WEIGHT: **GATEHOUSE:** DRIVER: TIPPER: REMARKS:

Oregon Waste Systems

A Waste Management Company

Star Route, Box 6
Arlington, OR 97812
(503) 454-2030 (Arlington)
(503) 281-2722 (Portland)

119 38816

	12 DEC 91
DATE:	
TIME:	03:43 AM
CUSTOMER NAME:	and taylance
CUSTOMER NUMBER:	
TRACTOR NUMBER:	252
TRAILER NUMBER:	·
SEAL NUMBER:	18578/
METRO INVOICE NO.:	
GROSS WEIGHT:	96700 LB
TARE WEIGHT-TRACTOR:	
TARE WEIGHT-TRAILER:	SSOOO LE IRON
NET WEIGHT:	63200 LB NET
NET WEIGHT.	*========
GATEHOUSE:	Dov.O
DRIVER:	
TIPPER:	1223
REMARKS:	

Oreg

Oregon Waste Systems

A Waste Management Company

Star Route, Box 6
Arlington, OR 97812
(503) 454-2030 (Arlington)
(503) 281-2722 (Portland)

132 38121

(1

	11 DEC 91
DATE:	
TIME:	O 07:58 AM
CUSTOMER NAME:	Mana toulone
CUSTOMER NUMBER:	
TRACTOR NUMBER:	254
TRAILER NUMBER:	
SEAL NUMBER:	18573/
METRO INVOICE NO.:	,
GROSS WEIGHT:	72540 LB
TARE WEIGHT-TRACTOR:	
TARE WEIGHT-TRAILER:	32020 LB TR(K)
NET WEIGHT:	40520 LB NET
	Cail 1
GATEHOUSE:	- Col
DRIVER:	
TIPPER:	
REMARKS:	

Oregon Waste Systems

A Waste Management Company

Star Route, Box 6
Arlington, OR 97812
(503) 454-2030 (Arlington)
(503) 281-2722 (Portland)

MC 30122

11 14 (3 3)
/) <u>08:00 AM</u>
Thoma Paudenie
·
185731
:
77380 LB
30340 LB TR(K)
42040 LB MEI
ani U
Row Dass
700 7700

Oregon Waste Systems

A Waste Management Company

Star Route, Box 6 Arlington, OR 97812 (503) 454-2030 (Arlington) (503) 281-2722 (Portland)

33071

	10 DEC 91
DATE:	
TIME:	03:22 PM
CUSTOMER NAME: Morte	west Envices.
CUSTOMER NUMBER: Kke	me fordere.
TRACTOR NUMBER:	252-
TRAILER NUMBER:	
SEAL NUMBER:	
METRO INVOICE NO.:	٠ ـ ـ ـ ـ ـ ـ ـ ـ ـ ـ ـ ـ ـ ـ ـ ـ ـ ـ ـ
GROSS WEIGHT:	31900 LB
TARE WEIGHT-TRACTOR:	
TARE WEIGHT-TRAILER:	33000 LB TR(K)
NET WEIGHT:	48900 LB NET
NDI WEIGHT.	
GATEHOUSE:	Blw
DRIVER:	JouBackero.
TIPPER:	· · · · · · · · · · · · · · · · · · ·
REMARKS: Cont Soc	

Oregon Waste Systems

A Waste Management Company

Star Route, Box 6
Arlington, OR 97812
(503) 454-2030 (Arlington) (503) 281-2722 (Portland)

210 50072

DATE:	DEC 1998 Sold
TIME:	
customer name:	one tollowlene
CUSTOMER NUMBER:	185731
TRACTOR NUMBER:	
TRAILER NUMBER:	
SEAL NUMBER:	
METRO INVOICE NO.:	
GROSS WEIGHT:	103 560
TARE WEIGHT-TRACTOR:	
TARE WEIGHT-TRAILER:	\
NET WEIGHT:	J 50 200
37400	<u>+ 15960 53360</u>
	BU)
GATEHOUSE: [
_	1 170/1/61
יסיססדים.	
TIPPER:	
TIPPER:	
REMARKS:	
REMARKS:	
REMARKS: 103560 Gross	

Oregon Waste Systems

A Waste Management Company

Star Route, Box 6
Arlington, OR 97812
(503) 454-2030 (Arlington)
(503) 281-2722 (Portland)

PIOS6 111

10 TEC 91 DATE: 07:24 AM TIME: hove Paulona CUSTOMER NAME: CUSTOMER NUMBER: 178 TRACTOR NUMBER: TRAILER NUMBER: 185731 SEAL NUMBER: METRO INVOICE NO.: 72900 LB GROSS WEIGHT: 30340 TARE WEIGHT-TRACTOR: TARE WEIGHT-TRAILER: NET WEIGHT: 47560 **GATEHOUSE:** DRIVER: TIPPER: REMARKS:

Oregon Waste Systems

A Waste Management Company

Star Route, Box 6
Arlington, OR 97812
(503) 454-2030 (Arlington)
(503) 281-2722 (Portland)

119 88042

10 050 31 DATE: 01:06 FM TIME: Khove outeur, CUSTOMER NAME: CUSTOMER NUMBER: TRACTOR NUMBER: TRAILER NUMBER: SEAL NUMBER: METRO INVOICE NO.: 101960 LB GROSS WEIGHT: 54160 TARE WEIGHT-TRACTOR: TARE WEIGHT-TRAILER: NET WEIGHT: **GATEHOUSE:** DRIVER: TIPPER: # 185731 **REMARKS:**

Oregon Waste Systems

A Waste Management Company

Star Route, Box 6
Arlington, OR 97812
(503) 454-2030 (Arlington)
(503) 281-2722 (Portland)

132 87961

09 DEC 91 DATE: 02:34 PM TIME: CUSTOMER NAME: CUSTOMER NUMBER: TRACTOR NUMBER: TRAILER NUMBER: 185731 SEAL NUMBER: METRO INVOICE NO.: 89600 LB **GROSS WEIGHT:** 33240 TARE WEIGHT-TRACTOR: TARE WEIGHT-TRAILER: NET WEIGHT: **GATEHOUSE:** DRIVER: TIPPER: REMARKS:



Sevil 3

TIPPER:

Oregon Waste Systems

A Waste Management Company

Star Route, Box 6
Arlington, OR 97812
(503) 454-2030 (Arlington)
(503) 281-2722 (Portland)

10 DEC 91

DATE: 02#22 Art TIME: Ram Pardine CUSTOMER NAME: CUSTOMER NUMBER: 254 TRACTOR NUMBER: 7548 TRAILER NUMBER: 185731 SEAL NUMBER: METRO INVOICE NO.: 81360 LB GROSS WEIGHT: 32020 TARE WEIGHT-TRACTOR: TARE WEIGHT-TRAILER: NET WEIGHT: 4934() **GATEHOUSE:** DRIVER:

REMARKS:

Oregon Waste Systems

A Waste Management Company

Star Route, Box 6
Arlington, OR 97812
(503) 454-2030 (Arlington)
(503) 281-2722 (Portland)

sakurita u kriitakiri tulli, suuri kirili,

NP 38168

11 DEC 91 DATE: 03:27 PM TIME: CUSTOMER NAME: CUSTOMER NUMBER: TRACTOR NUMBER: TRAILER NUMBER: SEAL NUMBER: METRO INVOICE NO.: 64480 LB GROSS WEIGHT: TARE WEIGHT-TRACTOR: 77020 TARE WEIGHT-TRAILER: 5460 NET WEIGHT: **GATEHOUSE:** DRIVER: TIPPER: REMARKS:

		SHOW ENTIRE B/L NO					NUMBE	R ·	B/L NUMBER	
RHON RHONE POUL		DULENC	Straight Bill of	PING ORDER AND BI Lading - Short Form -	Original - Not I	Vegotiable		•	SEA 2669	
1		Received, subject to th	e classifications and	d lawfully filed tariffs in e	ffect on the date	of issue of th				
		At (origin):	•			CATION	DATE OR	DERED	12 09 91	
		(9,	•		From	T c	1		12 03 31	
CARRIER	NOR	THMEST ENVIROMENTAL	. CA	RRIER CODE			CUSTON	ER NC		
			property describ	est to the chassion duct undirum the in effect ed in the Griginal Briot's liding the property hts and condition of contents of backlages which spad framer the word chirules being	gestrided be with 100 frem unknown i myrked innn gr	t grod older except ed and destined as	FOB	ORIGIN		
OREGON V	NASTE A RID	K SYSTEMS INC. GE LANDFILL	any person of un of delivery all sa destination (1); route to destinat	Repression in possession of the property undi- indicestingtion of on its trute, sportwise to multiplies agreed as to earn carrier of all or in on and as to each batty at any other interest	VEH INIT	INIT & NO				
STAR ROL			Bill of Lading set water shipment	hereunder shall be subject to all the terms (orthirt) in Uniform Freight Crassification in or (2) in the applicable motor carrier classif	reflection the date herecrification or tardfiles this is a ne	this is a rail or a rail. For Carrier shipment			be prepaid, write	
ARLINGTO	ON OR	EGON 97812	-ncluding trase 1	Shaper hereby certifies that he is familiar with a time terms and conditions of this said bill of lading including those on the base thereof set forth in the classification of build which givers some transportation of the said entires and in disclosurements and in said entire said entire on severe the condition of the said entire and conditions are the said entire that the said entits that the said entire that the said entire that the said entire						
			and his assigns		igreed to by the still ser and	at Lesied (Strainse-	<u> </u>			
ule			CUSTOMER	P.O. NO			l P	-P ORDER	VO .	
nno.	DUCT C	CODE AND DESCRIPTION	CONTAINERS	TOTAL UNITS	5	LOT NO	$\overline{}$	PREPAID	SHIPMENTS ONLY	
PHO		ODE AND DESCRIPTION	CONTAINERS	ORDERED	SHIPPED	LOT. NO	J. I	INVOICIN	G INSTRUCTIONS	
U				•			1		RPAYMENT	
									Copy 3 of r's Bill of Lad-	
									your Freight	
ľ			-					_	and mail to	
_									Poulenc Inc.	
:							1			
			}				}			
							1			
ļ										
y ·			1				•			
							}			
					·					
•							1			
li					11					
ARRIER REMARK	S			•				Conditi	ect to Section 7 of ons of applicable	
•							ļ	ment is	iding II this ship- To be delivered to signee without re-	
)							[the co	on the consignor, isignor shall sign	
}								The	Carrier shall not stivery of this ship-	
								ment w freight i	ithout payment of and all other lawful	
1							i	Rhone	Poulenc, Inc.	
PLACARD	S PRC	OVIDED					}	(Signa	ure of consignor)	
PIECES	нм	KINDS OF PACKAGES — PROPE	R DOT SHIPPING DOT EXCEPTION	NAME — HAZARD CLAS	SS - IDENTIFIC	MUN NOTA	BER	Frt. Code	WEIGHT	
	ļ —				· · · · · · · · · · · · · · · · · · ·					
ONE		EXCAVATED SOIL			ZARDOUS 1	ASTE			[
DUMP	1	NOT A WASHINGTO	N STATE REG	ULATED WASTE						
TRUCK		PROFILE # 185731						1		
&				·						
TRAILE	R	EXCANATED XDIRTXQQNTA		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX					EST.	
	+	TOTAL PIECES SHIPPED; PA		LOOSE _		TOTAL	WEIGHT	→	50,000	
}—————		V 523 1843	at Kala sai	PENERTHE.	FLE 400 = 0					
"If the shipment m	oves between	two ports by a carrier by water, the ruw requires that the billion entitin value, shippers are required to state scene (1049), it written	lading shall state whether it is	CATHERS TO SHOUDER SINCEONS	SHIPMENT IS CO		SCRIBED	C.O D. Am	nt	
declared value of	the property	is Rereby specifically stated by the shipper to be not exceed	- /	and the state of t	ECT WEIGHT IS _		Les	Pilection		
RHÔNE	POU	LENC INC Shipper,	Per i Rila	Carrier L	Bucke	Per Miss	35 ₁ 7	otal Cha	rges	
ermanent pe CN 5266	ost-office	address of shipper	1 45-1 A			T1?	111			
Princeton, N. ATTN:				CERTIFICATION S		 	16276			
		ION DEPT. Instructions Above)		This is to certify that the a and are in proper wond Transportation						

		SHOW ENTIRE B/L NO.	ON YOUR FRE	GHT BILL AS PAYM	ENT IS BASE	D ON THIS	NUMBER	B/L NUMBER
	-	ULENC		PING ORDER AND B Lading - Short Form -			1.7	SEA 2600
RHONE POULER	AC INC	Received, subject to the	classifications an	d lawfully filed tariffs in o	effect on the dat	e of issue of th	nis Bill of Lading.	SEA 2680
		At (origin):	SFATTLE	ШΔ		OCATION	DATE ORDERED	12-09-91
		, in (origini,	OZMI I EZ	#4	From	- 7¢		12-03-31
ARRIER	NOR	THWEST ENVIRONMENT	AL CA	ARRIER CODE			CUSTOMER NO	
,			2122 HRV Set 1	sect to the crassitication and har than effective the program of the conjugate program of the co	ivides Hald be twim valare siurikraws imirked izrasij	ent grod order lexical gred, and destined as	ORIG	IN
COLUMBIA	A RI	E SYSTEMS INC DGE LANDFILL	any person of p of derivery at s destinution. It	Inidoration in possession of the property un said desimation of on its indee otherwise is mutually agreed as to each darrier of an or at on and as to each party at any time interer	der the Lintruct lugrees to t to deliver to unother (larrie) runy of said property over al	arry to its usi-all place in the tribute to 1940 in priany portion of said.	VEH INIT & NO	·
STAR RO			is be performed Bit of Lading si	d bereunder sharl be subject to all the term et forth in Lin uniform Freight Classification	s and conditions of the Unit in effect on the date hereot	orm Domestic Straight of this is a radior a rain		to be prepaid, write
ARLINGT	ON O	REGON 97812	Shipper he including those	 Or (2) in the applicable motor nather class treby certifies that he is familiar with an Briton the back ingred set form in the classification he had terms and upod sons are hereby is 	he serms and conditions of Idation or twilf which govern	the said bit of lading is the transportation of	or stamp here.	"To be Prepaid."
loute			CUSTOMER				R-P ORDE	NO.
•				TOTAL UNIT	s		DEEDAN	SHIPMENTS ONLY
PROD	DUCT C	ODE AND DESCRIPTION	CONTAINERS	ORDERED	SHIPPED	LOT. NO	INVOICE	NG INSTRUCTIONS
ļ					i		1	OR PAYMENT
<u>.</u>			} }				L L	h Copy 3 of er's Bill of Lad-
		_					1 ' '	your Freight
•					.		_	e and mail to
					1		Rhone	e-Poulenc Inc.
i								
į.								
<u> </u>			İ				Ì	
•			1 1				{	
y			1				•	
<u></u>								
						!		
		•	-		1			
•							İ	
CARRIER REMARKS	5					<u> </u>	s	ubject to Section 7 of
j							b:11 o	itions of applicable flading if this ship- is to be delivered to
r \							cour	onsignee without re-
							the f	consignor shall sign ollowing statement ne carrier shall not
ŀ							make ment	delivery of this ship- without payment of nt and all other lawful
		_			·		char	
PLACARD	S PRO	VIDED			•			nature of consignor)
PIECES	нм	KINDS OF PACKAGES — PROPE	R DCT SHIPPING	NAME — HAZARD CLA	SS — IDENTIFI	ICATION NUM	BER Fr.	e WEIGHT
				· <u></u>			- t	
·]	
ONE		EXCAVATED SOIL C		G COPPER			İ	
DUMP TRUCK		NON-HAZARDOUS WA		ECHIATED MAC	יחיבי	•		
IRUCK		PROFILE NUMBER 1		EGULATED WAS) I E		\'	
		1		ODE, SEE REVERSE	SIDE			EST.
]:	*	TOTAL PIECES SHIPPED; PA		LOOSE _		TOTAL	WEIGHT 🔿	50.000
<i>j</i> ————			rW. P.			(<u>]</u> (\$-4-6.[]		
NUTE - Where the	116 IZ GSD6 bg	Implicate by a carrier by water the raw requires that the Cition entition value. Thispers are required to state specifically in writing is hereby specifically stated by the shipper to be not exceed.	the agreed or sectured value	is currently ar shropy we ght of this	SHIPMENT IS	CORRECTLY DE	i	
/		<u>ger</u>	7	- COR	RECT WEIGHT IS		LBS Collect	//
		ILENC INC. Shipper,	Per <u>/ / // /</u>	Carrior		Per	Total	ges
CN 5266 Princeton, NJ		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	\.a . 1	CERTIFICATION S	SIGNATURE	1.15.	1hh	
ATTN: TRANS	SPORTAT	TION DEPT. WY DLWC	jano	This is to cert by that the	above named mater	are properly cla	issified described paci- the applicable regulat	kaged, marked and labeled ons of the Department of
1A-58-2 C-7/89		COST DEPARTMENT						
ľ	U	 -						

F KHUNE-PC	ULENC_		SHIP	PING ORDER AND B	ILL OF LADIN	NG	,	 	NUME
RHONE-POULENC INC		E		Lading - Short Form -			hin Dill of Ladia	1	2683
				d lawfully filed tariffs in (OCATION	DATE CROCKE		DATE
		At (origin):	SEATTLE	WA	From		4	12.	-11-
CARRIER NO	RTHUFCT	ENVIRONME		RRIER CODE			CUSTOMER NO		
	KINWESI	LNVIRONHLI	NIAL OA						
	,		property descrip	ect to the class fir Blich und callife in effe- leg in the Gright's Blitary unding the crick fi hts and condition of contents of collection	y destricted by the first re-	ent ende biden eintebr	FOB		
OREGON WA	STE SYS	TEMS INC	nd caled being any person of a	which said hair en the word barrier being discriation in cossession of the proberty uni	understand through unital der the Justinistrikgrees in	sitentractias melating liarry to its askat place	ORIGI		
COLUMBIA	_		Sestinguian It is	aid destination, if on its route, otherwise, imutually agreed as to each carrier of all or tion and as to each party at any time interes	any of Swid Stoperty Eventy	hor any oction of said	1011 1111		
STAR ROUT			Billiot Lading se	nereunder shak be subject to at the fermi Florth (1) in uniform Freight Chassification of (2) in the applicable motor carrier class	in effect on the gare helect.	Athis same margin	If charges ar		
ARLINGTON	OREGON	9/812	Shipper he including those	reby certifies that he is tamiliar with all th on the back thereof, set form in the classific	re serms and conditions of cation or tigriff which govern	the said bir of lading is the transportation of	or stamp her	e, "To be	Prepai
			ins shipment at and his lassigns	of the said lerins and conditions are hereby	agreed to by the shifter an	d accepted for firmself			
			CUSTOMER	P.O. NO.			R-P OR	ON REC	
				TOTAL UNIT					
PRODUCT C	ODE AND DE	SCRIPTION	.CONTAINERS	ORDERED	SHIPPED	LOT NO		AID SHIPM ICING INS	
								FOR PAY	MENT
				•				ach Co	
			}					per's B to you	
•	o o							ice and	
							l l	ne-Pou	
			1						
							İ		
							{		
			1 1				ļ		
			1			1	ļ		
1									
7									
							ļ		
IER REMARKS						L		Subject to S	ection 7 o
-							ים	onditions of ill of lading II	applicable If this ship
							in co	ent is to be d ie consignee i ourse on the	without re consigno
							j tn	e consignor le following st The carrier	shall sig latement
							"	ake delivery o	of this ship payment o
					•		C†	eight and all o	
LACARDS PRO	VIDED							ne Pou	
	KINDS OF	PACKAGES — PROPI	ER DOT SHIPPING	NAME - HAZARD CLA	SS - IDENTIF	ICATION NUM		rt	
IECES HM			DOT EXCEPTIO	NS - DOT EXEMPTION	IS		C	ode	WEIGI
					257	-252	۲		
E	EXCAV	ATED SOIL	CONTAININ	G COPPER			}		
MP	i — :	AZARDOUS WA							
JCK	NOT A	WASHINGTO	N STATE R	EGULATED WAS	STE				
	PROFI	LE NUMBER	185731						
	<u> </u>	F	OR FREIGHT CO	DE, SEE REVERSE	SIDE			li li	ST.
─	TOTAL PIEC	CES SHIPPED; PA	ALLETS	LOOSE _		TOTAL	WEIGHT -	→ 30	,000
				SEATING THE] [] []	(S.6-33:53			
	INO ports by a Carrier by i	water the law requires that the bill o	liading shall state whether it is		SHIPMENT IS C		SCRIBED CO	D Amt	
"Il the shipment moves between NOTE Where the rate is denominated	s hereby specifically stat	led by the shipper to, be not exceed	aind . A the waters of decision earlie		RECT WEIGHT IS		LBS Colle	ction Fee	
"Il the shipment moves between NOTE Where the rate is depend declared value of the property									
III the shipnient moves between NOTE Where the rate is depend declared value of the property		Shipper,	Per 7.13.1	Carrier _		Per		harges _	
deciated value of the property	LENC INC.		Per <i>J.B.</i> /	Carrier		Per	12/10/8	Charges _	

RA-58-2 C-7/89

-2 C-7/89

P RHÔN	E-DO	<u> </u>	TIRE B/L NO.	ON YO		PING ORDER					NUMBE	7	B/L NUMBER		
RHONE-POULEN			ved, subject to the		ght Bill of	Lading - Sho	rt Form - (Original	- Not No	gotiable	nie Bill of	Ladina	SEA 2671		
					Cations an	id lawlony med	(aiiiis iii ei	ilect on		ATION	DATE OF		SHIP DATE		
		A	(origin):		SEA	TTLE WA			Frem	Tre	-				
CARRIER		W05=****	~ =======		CA	ARRIER CODE				† · · · ·	custo.	'ER NO	: 12-09-91		
		NORTHWES	T EMVIROR	NMEN	RECEIVED SU	piero ny tine krassification la ribed in tine Griginal Billiotica					FOB	Origin			
Columb	ia E	ste System: Ridge Land:			As noted in Prenty and Condition of contents of plackages unentwent mathed Conditional and destined its indicated between which said native rithe world carrier being to destand throughout this contract as meaning.						VEH IN	INIT & NO			
Star R Arling		e 6 , Oregon 91	7812		to be performe Bill of Lading st water shipmen Shipper he including those	id hereignder shalf be subject ell forth (1) in Uniform Freigh (1, n) (2) in the applicable mo ereby cert fles that he is fa t on the back thereof set for ang the said terms and cynd.	t to up the terms a of Classification in for narrier classific miliar with an the thin the reassifica	and conditions effection the cation or tariff terms and co it on or tariff w	i of the Uniform (dute hereof if the is this is a motor inditions of the s nirn governs the	Onmestic Straight s is a ruitor a rail carrier snipment said bill of lading transportation of		narges are to be prepaid, write tamp here, "To be Prepaid."			
oute			· · · · · · · · · · · · · · · · · · ·		CUSTOMER	7 P.O. NO.					-	R-P ORDER	NO		
						10	TAL UNITS								
PROD	UCT C	ODE AND DESCRI	PTION	COM	TAINERS	ORDER			PED	LOT. NO).		SHIPMENTS ONLY GINSTRUCTIONS		
													R PAYMENT		
					į								Copy 3 of		
													r's Bill of Lad-		
		~						1					your Freight		
				ļ									and mail to		
								Ì	}			Knone	Poulenc Inc.		
				-	,										
						i *					Ì				
								}							
									1						
			•	- [ĺ				{		1				
							•		1						
				1		l		1	1		1				
				1											
ARIER REMARKS					-								nect to Section 7 of		
												Dill of I	aging. If this ship- to be delivered to		
				•								course	on the consignor,		
												the los	nsignor shall sign owing statement - carrier shall not		
					,			,				make d ment v	elivery of this ship- inthout payment of		
					M	1 1				•		freight Charge	and all other lawful		
S' 404550		VIDED.			\mathcal{G}_{i}	And	11.6		-]		Poulenc, inc.		
PLACARDS	PHO	· · · · · · · · · · · · · · · · · · ·		_//	7 :							_==	(ure of consignor)		
PIECES	нм	KINDS OF PACK	AGES — PROPE			NAME — HAZA NS — DOT EXI			ENTIFICA	TION NUM	BER	Frt. Code	WEIGHT		
ne		Eveavat	ed Soil	Cont	taini	ing Conn	er								
ump			zardous W			rug copp	CI	,					·		
ruck		1	Vashingto			Regulat	ed Wa	STP							
ituck			Number			Kegarat	eu na	300				-	}		
railer		110111		105	, , ,										
			FO	R FRE	IGHT C	ODE, SEE RE	VERSE S	SIDE					Est.		
	*	TOTAL PIECES		LLETS			OOSE _			TOTAL	WEIGHT	-	50,000		
<u></u>		¥ :			eve r = rekare	. Wester		লিবুরি _{বি}	\$00°-43°	 .(n={}B(0))			1		
"If the Shigment mor	es between	two ports by a carrier by water the intion value offippers are required to	rism requires that the bill of	ac ng shar s	late whether d	S Carrier S at Shigher Line		SHIPMEN	IT IS COF	RECTLY DE	SCRIBED	CODA	nt		
deciated value of th	e property i	s hereby specifically stated by the	shipper to be not exceede	ing	-	711	[ECT WE	GHT IS		LBS	Collectio	n Fee		
RHÔNE	POU	LENC INC.	Shipper, F	Pari	8.1	Car	rier			er		Tolai dha	irges		
Permanent pos		ddress of shipper.	Simpler, I	· • · /	4. P. J. J. J. J. J. J. J. J. J. J. J. J. J.	ar				7		/-			
CN 5266 Princeton, NJ (D8543-526	36				CERTIFIC	CATION SI	GNATU	RE	15.1					
		ION DEPT. Instructions Above)		•									ged marked and labeled as of the Dopartment of		
fireia staidut i	-y-ment i					Transportat	ion .								
-58-2 C-7/89		COST DEPAR	TMENT												

B/L NUMBER

AHONE-POULENC INC

CARRIER

NC	Straight Bill of Lading — Short Form — Original — Not Negotiable Received, subject to the classifications and lawfully filed tariffs in effect on the date of issue of this Bill of Lading.								
	At (origin):	SEATTLE, WA		LOCA	TION	DATE ORDERED	SHIP DATE		
	At (origin). 5			From	To	7			
NORTHWEST	ENVIRONMENTAL	ODE			CUSTOMER NO				
		property described in the Griginal	nation and out its in effect on the date is Bis of Lading the officers described be of contents of sixpages unknown, injury	win Hodarent ger	d bide, extest	ORIGIN			

OREGON WASTE SYSTESM INC COLUMBIA RIDGE LANDFILL STAR ROUTE BOX 6 ARLINGTON OREGON 97812

accounts of the passing of the Bird Content of the passing of the

If charges are to be prepaid, write or stamp here, "To be Prepaid."

VEH INIT & NO

CUSTOMER P.O. NO. R-P ORDER NO.

					.
PRODUCT CODE AND DESCRIPTION	CONTAINERS	TOTAL UNITS ORDERED	SHIPPED	LOT. NO.	PREPAID SHIPMENTS ONLY INVOICING INSTRUCTIONS FOR PAYMENT
	•				Attach Copy 3 of Shipper's Bill of Lading to your Freight Invoice and mail to Rhone-Poulenc Inc.
RRIER REMARKS			<u></u>		Subject to Section 7 of Conditions of applicable bill of lading if this ship-

bill of lading. It fins ship-ment is lo be delivered to the consignee without re-course on the consignor. The consignor shall sign the following statement. The carrier shall not make delivery of this ship-ment without payment of freignt and all other lawful charges.

Rhone Poulenc, Inc. PLACARDS PROVIDED (Signature of consignor)

PIECES	нм	KINDS OF PACKAGES - PROPER DOT SHIPPING NAME - HAZARD CLASS - IDENTIFICATION NUMBER DOT EXCEPTIONS - DOT EXEMPTIONS	Frt. Code	WEIGHT
E MP UCK		EXCAVATED SOIL CONTAINING COPPER NON_HAZARDOUS WASTE NOT A WASHINGTON STATE REGULATED WASTE PROFILE NUMBER 185731		D.C.W.
'		FOR FREIGHT CODE, SEE REVERSE SIDE		EST.
<u></u>	+	TOTAL PIECES SHIPPED; PALLETS LOOSE TOTAL WEIGHT	→	50,000

	a hiji e in Katale da.	i i i i i i i i i i i i i i i i i i i	16 [13] [15] 16] 16] 16] 16] 16] 16] 16] 16] 16] 16	
	offer tine (excrees that the bill of facing shart state whether it in duried to state Specifically in writing the agreed of declared value it by the shipper to be not exceeding per		THIS SHIPMENT IS CORRECTLY DESCRIBED CORRECT WEIGHT IS	
RHÔNE POULENCINC	Shipper, Per 13	Carrier	Per	Total Charges
manent post-office address of shipper, 5266 Princeton, NJ 08543-5286 ATTN:	0 0	CERTIFICAT	TION SIGNATURE T.B. 16	h -
TRANSPORTATION DEPT. (Note Freight Payment Instructions Above)	non Drog		that the Above-named materials are properly classified, de- per Condition for transportation according to the applic	

This is to certify that the above-named materials are properly classified, described, backaged, marked and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

eton, NJ 08543-5266

(Note Freight Payment Instructions Above)

Dille

~ _		SHOW ENTIRE B/L NO.	N Y					ON THIS	NUMBE	R	B/L NUMBER	
		ULENC	Str		PPING ORDER AND BIL I Lading - Short Form - C			gotiable		•	SEA 2674	
RHONE-POUL	ENC INC	Received, subject to the	classi	ifications ar	nd lawfully filed tariffs in eff	fect on	the date o	f issue of th	nis Bill of	Lading.	2074	
		At (origin):	SI	EATTLE	E WA	[LOC	ATION	DATE OF	RDERED	SHIP DATE	
		, (eg,	ricm To						12-09-9			
ARRIER			CARRIER CODE							ON PANCTE		
	 _	NORTHWEST ENVIRONM	EN'		Dentito the crassification and bir ffs. hierrectic	n (na dica		70. 1 20. 20. 20. 20.	FOB			
				45 hoted (00)	GIN							
OBECON	17 4 5 77	E SYSTEMS INC		indicated below, which said carrier one exicultative being understood throught with sincipitat at meaning any person of chooling indication of the property under the individual agrees to carry to its usual place of delivery at said destination, if on its vidue otherwise to deliver to understood on the following to day.								
		DGE LANDFILL		destination. It is multiparty agreed as to ear in carrier of all or any of said property, over all or any portion of said course to destination and as to each party at any time interested in all or any of said property that every service.								
STAR R		_		Billinitading	rd nereunder snak be subject to all the terms an let forth cit, in Uniforn Freight Classification in e If, St. (2) in the applicable motor carrier classifica	Heat on the o	rate hereot, 1 thi	Sis à favet à faire	If char	ges are to	be prepaid, write	
		OREGON 97812		Shipper h	ereby certifies that he is familiar with an the li e on the back thereof, set forth in the classificati	leims and co ion oi lurill w	ndiline enriche. Artigovernstre	said bill of lading transcritation of	or stan	np nere, "	To be Prepaid."	
1				and his assign	and the said terrins and conditions are hereby agr ns	reed to by the	shipperand (co	epted for nimseri	<u>l</u>			
ule				CUSTOME	R P.O. NO.		· · · · · · · · · · · · · · · · · · ·			R-P ORDER	NO.	
				<u> </u>								
PRO	DUCT C	ODE AND DESCRIPTION	·cc	NTA;NERS	TOTAL UNITS	SHIP	,,,,,	LOT. NO	o.		SHIPMENTS ONLY GINSTRUCTIONS	
	-		+		ONDERED	J Shir	PEU				R PAYMENT	
						-	ì		- {	Attach	Copy 3 of	
_					,		ļ				r's Bill of Lad-	
	-	•					ì		ļ		your Freight	
											and mail to	
_									}	Knone-	Poulenc Inc.	
1												
							1					
_					i.				ļ			
			1									
•						1	1					
									ļ	٠		
							{		ĺ			
									ļ		,	
	•											
ARRIER REMARK	s				,		•	-			rect to Section 7 of ons of applicable	
.										ment is	aging. If this ship- to be delivered to isignee without re-	
									1	Course	on the consignor, risignor shall sign	
									J	The	owing statement carrier shall not elivery of this ship-	
5									1	ment w freight	ithout payment of and all other lawful	
										Rhone	Poulenc, Inc.	
PLACARE	S PRO	VIDED									lure of consignor)	
PIECES	нм	KINDS OF PACKAGES — PROPER			S NAME — HAZARD CLASS		ENTIFICA	MUM NOT	BER	Frt. Code	WEIGHT	
	 	-	00.	EXCEPTION	DIVO - DOT EXEMIT HOUS				·	Code	 	
										İ		
ONE	}	EXCAVATED SOIL C			IG COPPER					}		
DUMP		NON-HAZARDOUS WA			מברווו אדבה נואפי	ידי				- [
TRUCK	İ	PROFILE NUMBER 1			REGULATED WAS.	ıc						
	1	ļ									EST.	
	+	FO	R FF	REIGHT C	ODE, SEE REVERSE S	IDE						
İ	*	TOTAL PIECES SHIPPED; PA	LLET	rs	LOOSE			TOTAL	WEIGHT	· 	50,000	
į.		图 原獲 二氯酸	÷ 75.	in Name (1987) Diskups (1984)	. 	<u> </u>	at tend	.:-38:::				
"Il the shipment i	Moves Delween	two ports by a carrier by water the law requires that the billion is entire nation, after the private to state specifically in writing t	ne agree	ali State whether it ed or decrared varu	S'Allier's ar Shipper's weight THIS S	SHIPMEN	NT IS COP	RECTLY DE	SCRIBED	C.O D. Ar	nt	
declared value of	I the property :	is hereby specifically stated by the shipper IC. De not exceeding	¢				GHT IS		LBS	Collection	-5ee	
		LENC INC. Shipper, F	er_	J.K.	Carrier		Р	er		Total Cha	ýges	
N 5266 .		address of shipper,		-	CERTIFICATION SIG	GNATIII	RE /	R	16	h	_	
Princeton, N		ION DEPT.	_		This is to certify that the ab			are properly cit	ssilied de-	Cribed name	ned marked and labeled	
		Instructions Above)	–		and are in proper condit Transportation							
1 ED 0 0 7:00	1	- /	- ر.	200 5								
V-58-2 C-7/89	IJ	COST DEPARTMENT										

SHOW ENTIRE B/L NO					NUMBER	B/L NUMBER
RHÔNE-POULENC	Straight Bill o	PPING ORDER AND BIL f Lading — Short Form — C	Original – No	of Negotiable		SEA 2675
Received, subject to the		nd lawfully filed tariffs in ef	fect on the d	LOCATION	DATE ORDERED	SHIP DATE
At (origin):	SEATTL	E WA	Fr			
CARRIER NORTHWEST ENVIRONMENT	TAL CA	ARRIER CODE			CUSTOMER NO	12-09-91
OREGON WASTE SYSTEMS INC	property describes noted ream indicated bero	bject to the class fication and suntils in effect in tiped in the Original Bill of Suding the sincerty of tents and condition of contents of List Ages will within said narrier (the wind carrier being un	tescribed tie Lik in 1920 nannwark mirraid (ch ndersträd throughful)	stent grad proef except to ando and described as this contract as meshing	FOEORIGIN	I
COLUMBIA RIDGE LANDFILL STAR ROUTE BOX 6	of delivery at desimation. It is destin	corporation in possessium of the property under said destination if on its route, otherwise to it is mutually agreed as to each carrier of all or an altion and as to each party at any time interested	deliver to unitine it all ny filisa diproperty nye din hit yr anv ni saidol	then on the route to said in right or any portion of said in rocerty that every service.	VEH INIT. & NO	
ARLINGTON OREGON 97812	Bill of Laging s water shipmer Shipper h including thiss	to hereunder shall be subject to an the terms a let forth 1, in Uniform Freight Cassification in it or 12 in the applicable motor carrier classific ereby certiles that he is familiar with all the to en the back thereof, set forth in the classification and the said terms and conditions are hereby said to	effect on the date here ation or far files this is ferms and conditions ion or fariff which gov	of this is a ray or a rail. A motor cather shoment, of the said bit of fading eths the transportation of		to be prepaid, write , "To be Prepaid."
oute	CUSTOME				R-P ORDE	R NO.
PRODUCT CODE AND DESCRIPTION	CONTAINERS	TOTAL UNITS ORDERED	SHIPPED	LOT. NO	INVOIC	D SHIPMENTS ONLY ING INSTRUCTIONS
					Attac	ch Copy 3. of
		·			1 ' '	er's Bill of Lad- oryour Freight
•					1	ce and mail to e-Poulenc Inc.
•						
				1		
ARRIER REMARKS			<u></u>			Subject to Section 7 of
					Con bill	ditions of applicable of lading. If this ship- it is to be delivered to consignee without re-
					the	se on the consignor, consignor shall sign following statement
					mak men	he carrier shall not e delivery of this ship- I without payment of
L 51 4 6 4 5 5 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7					Chai	e Poulenc, Inc.
PLACARDS PROVIDED	207.01.02011.0		n inchiti	CICATION AND		nature of consignor)
PIECES HM KINDS OF PACKAGES - PROPER		ONS - DOT EXEMPTIONS			Cod	
ONE EXCAVATED SOIL CO		IG COPPER	5	252.25	27	
DUMP NON-HAZARDOUS WAS TRUCK NOT A WASHINGTON		REGULATED WAS	TE			
PROFILE NUMBER 1	85731					
		ODE, SEE REVERSE S	IDE	70741	W510117	EST. 50,000 xx*xxxxx
TOTAL PIECES SHIPPED; PAL	LETS 	LOOSE	7.77	TOTAL (WEIGHT -	XXXXXXXXX
"If the shipment moves between two ports by a carrier by water the raw requires that the bill of tao." NOTE: Where the rate is dependent on value, chippers are required to state specifically, writing this decrared value of the property is hereby specifically stated by the shipper to be not exceeding	ing shall state whether it is a greed or declared value	S CATHER'S OF Shipper A reight THIS S		CORRECTLY DE		Amt
RHÔNE POULENC INC. Shipper, Po	er 1.13.	Carrier O	i. Pa	Esper Nigh		harges
Permanent post-office address of shipper. CN 5266 Princeton. NJ 08543-5266		CERTIFICATION SIG	GNATURE	1.8.	ilah	
ATTN: TRANSPORTATION DEPT. (Note Freight Payment Instructions Above)		This is to certify that the ap	ove-named male			kaged marked and labeled, lions of the Department of

P RHÔN	IF-P^		OW ENTIRE B/L	40. ON Y		IGHT BILL AS F			ON THIS	NUMBER	>	B/L NUMBER
$\overline{}$		OLEIVC		Str	aight Bill of	Lading - Short F	orm – Origina	I - Not Ne	gotiable			
AHONE-POULE	AC INC		Received, subject t	o the class	ifications an	d lawfully filed tar	iffs in effect on	the date o	f issue of th			SEA 2676
			At (origii	า) : ร	EATTL	E WA			MOITA	DATE ORD		SHIP DATE 12-09-91
						BRIER CORE		From	To	CUSTOME		<u> </u>
CARRIER	NOR	THWEST	ENVIRONME	NTAL	CA	RRIER CODE				ļ		
J					proberly descr	pers to the crassification and to bed in the Original Brillot Lading	the conserty described be	tion in 182 mention	od bider except	FOB		-
OREGON	WAS	TE SYST	TEMS INC		na cales be on	ents and condition of contents which said carrier (the word's intogration in possession of the c	arrer being understand th	Houghout to \$ 75A1	ract as mexicing	OR I		
		IDGE LA			of derivery at 5	said destination, it on its route is mutually agreed as to earn car ation and as to each party at any	otherwise to deliver 10 d ner of all or any of said or	esther carrier on t oserty cyet 3 librar	me route to said. Ny portion of said.	VER INII	a NO	
STAR R					Bill of Lading si	d hereunder shall be subject to a et forth itt in Uniform Freight Cia	it the terms and condition issincation in effect on the	ns of the Uniform D e date hereof if this	omestic Straight	If charge	s are to	be prepaid, write
ARLING	TON	OREGON	97812		Shipper he including thrase	I or (2) in the applicable motor of creby certifies that he is familia control back thereof set forth in	r with all the terms and a the classification or built	conditions of the o what oldswerns the	aid bit of labing to nedationers	or stamp	here, "	To be Prepaid."
					and his assign	ind the said terms and Lyndilions	are nereby agreed to by h	he yn poer and woor	ested for numseli			
rute		··· 	· <u></u>		CUSTOMER	R P.O. NO.				R-F	ORDER	NO.
PROD	DUCT C	ODE AND D	ESCRIPTION	cc	NTAINERS		LUNITS		LOT. NO			SHIPMENTS ONLY
						ORDERED	SHI	PPED		"		G INSTRUCTIONS R PAYMENT
										γ.	ttach	Copy 3 of
				1				ĺ				r's Bill of Lad-
•											_	your Freight
				1	1							e and mail to Poulenc Inc.
<u> </u>										-		
j							.	·				
1												
				1				1				
				}								
					į		}					
1												
ARRIER REMARKS			 					<u>_</u>				ject to Section 7 of ons of applicable
										}	bill of to ment is	ading If this ship. To be delivered to
]											the co	isignee without re- on the consignor, nsignor shall sign
											The	owing statement carrier shall not elivery of this ship-
							•				ment w freight	nithout payment of and all other lawful
										F	?hone	, Poulenc, Inc.
PLACARD	S PRO		F PACKAGES — PR	OBER DO	SHIDDING	NAME HAZAR	D.C.I.ASS IF	SENTIFICA	TION NUM	IDED.	(Signa	lure of consignor)
PIECES	НМ	KINDS O	PACKAGES — PR	DOT	EXCEPTIO	NS — DOT EXEM	PTIONS		ITIO:V NON		Code	WEIGHT
ONE		EXC	AVATED SO	L COI	ТАТИТ	NG COPPE	R					
DUMP		1	-HAZARDOUS				•					
TRUCK		NOT	A WASHING	TON :	STATE	REGULATE	WASTE					
		PRO	FILE NUMBE	ER 185	5731							
				FOR FF	EIGHT C	ODE, SEE REVE	RSE SIDE		,			EST
, ————————————————————————————————————	*	TOTAL PIE	CES SHIPPED;	PALLET		LOC			TOTAL	WEIGHT	→	EST
			Karaji da	origination		(F.E. 1200 F.E. 1	KIL FREE	t i skij.				50,000
NOTE Wherether	ile is depende	intomikalue Shicoers a	Dy within the risk requires that the referenced to state specifically in Halled by the phipper thill be not in	willing the agree	in state whether it i d or declared value	Statiler Surshit Sweight of the property e agreed or	THIS SHIPME		RECTLY DE	j	C.O.D. An	
RHÔNF	POU	LENC INC.	per China	مر م	TP.		<u> </u>				Total Cha	ges
		ddress of shippe	Shipp r.	er, rer 🗲	- , , , ,	<u>Carrie</u>			er			
Princeton, NJ ATTN:				/	' //		TION SIGNATU		·/).	1000		
		ION DEPT. Instructions Abov	ve)	11/	this	This is to certify and are in ord Transportation	that the above man ber condition for t	red mater als a transportation	are properly of- according to	the applicable	ped packag regulation	ged marked and labeled, is of the Department of
	ſ	000= =		11/1	メゲ		_					
\-58-2 C-7/89		COST D	EPARTMENT	, (4 t							

		SHOW ENTIRE B/L NO. C					ON THIS	NUMBER	$\leq >$	B/L NUMBER
RHÔ!			Straight Bill (PPING ORDER A	orm – Origii	nal – Not Ne		sir Bill of L	adina	SEA 2677
		Received, subject to the			tts in ettect (ATION	DATE OF		SHIP DATE
		At (origin):	SEATTLE	E WA		From	Te	1		12-09-91
CARRIER	NORT	HWEST ENVIRONMENTA	AL C	ARRIER CODE				CUSTOME	R NO	
OREGON	WAST	E SYSTEMS INC	arctert, desi es acted con acted der any person o	coherch to the crass fleaken and har cribed in the Original Biolofic liding t intents and conduitor of toments to the which said carrier the word call of composition in possession of the o	ne property describe: I guckages unknown irrer being understio roperty under the con	d berowin (pourent ger Nimitsed in noighed), Od through-ur this cont Niruchi agrees to carry t	od order except and destined as ract as meaning ords usual place	FOB VEH INIT	ORIG	IN
COLUMB	IA RI	DGE LANDFILL	destination i route to desti to de pertorn	it said destination it on its route i It is mutually agreed us to each carr ination and as to each barty at any t red hereunder shair de sudject ha It set forth its in Uniform Freight Car	er of alt or any of sad ime interested in all of I the terms and cond	d property over all or an r any of said property to blicos of the Uniform Dr	y portion of said at every service mestic Straignt			be prepaid, write
STAR R	OUTE	BOX 6	Shipper including the	ent, or (2) in the applicable motor ca hereby certifies that he is familiar ise on the back (hereof set forth in) it and the said terms and Lund Jions GOS	with all the terms at the classification or be	ind conditions of the si will which governs the t	id bill of lading ranscortation of			To be Prepaid."
ARLING	TON O	REGON 97812		ER P.O. NO				R-	PORDER	NO.
PRO	DUCT CO	DE AND DESCRIPTION	CONTAINERS	TOTA ORDERED	L UNITS S	HIPPED	LOT. NO		NVOICIN	SHIPMENTS ONLY G INSTRUCTIONS R PAYMENT
								i	Shippe ng to nvoice	Copy 3 of r's Bill of Lad- your Freight and mail to Poulenc Inc.
ARRIER REMARK						· · · · · · · · · · · · · · · · · · ·			Condition of the course the course the course the course the course the course the course the course the course the course the course the course the course the course the course the course the course the course the course	pect to Section 7 of ons of applicable ading if this ship- to be delivered to be delivered to be delivered to on the consignor, nsignor shall sign owing statement carrier shall not elivery of this ship- ilhout payment of and all other lawful s Poulenc, Inc. lure of consignor)
PIECES	нм	KINDS OF PACKAGES — PROPER		G NAME — HAZARI ONS — DOT EXEM		IDENTIFICA	TION NUM	BER	Frt. Code	WEIGHT
ONE DUMP TRUCK		EXCAVATED SOIL C NON-HAZARDOUS WA NOT A WASHINGTON PROFILE NUMBER 1 FOF	STE STATE 85731							EST
	*	TOTAL PIECES SHIPPED; PAL	LETS	LOO	SE		TOTAL	WEIGHT	→	50,000
		E AND FINDS	FRE D. 4.	OFFICE S	OLL FREE	\$ \$45°~403°	~6, <u>\$</u> (6.0			
"If the shipment m NOTE - Where the deciated value of	rate is dependent the property is h	ports by a carrier by water the law requires that the bill of lad on value, impoets are required to state specifically in writing the ereby specifically stated by the shipper to be not exceeding	ding Shair State whether is se agreed or declared value	List Arrier's or Shipper's weight ue of the property of eagreed of	i .	MENT IS COR	RECTLY DE	1	C.O.D. An	
·	POUL	EAIC IAIC	P	1//	CORRECT			LBS	Total Cla	
ermanent po		Iress of shipper,	er / , / , / ,	LAK Carrier	·	Pe		7		•
CN 5266 Princeton, NJ ATTN:		D W	1	CERTIFICAT			12.	ILA	r	
	SPORTATIO Payment ins	N DEPT.	3	This is to certify and are in prof Transportation	inat the above-n per condition to	named materials a Dr. transportation	e properly cia according to	ssiled descri The applicabl	iDed packaj e regulation	ged marked and labeled is of the Dopartment of
A-58-2 C-7/89		COST DEPARTMENT								

SHOW ENTIRE B/L-NO	ON Y					NUMBE		B/L NUMBER
PRHÔNE-POULENC	S:r		PPING ORDER AND BILL f Lading — Short Form — O				. [
Received, subject to th	ne classi	fications an	nd lawfully filed tariffs in effe	ect on the da	te of issue of th			SEA 2678
At (origin):	SE	ATTLE	WA		LOCATION	DATE OF	DEREC	SHIP DATE
CARRIER NORTHWEST. ENVIRONMENT	, cust						EP NO	12-09-91
OREGON WASTE SYSTEMS INC OREGON WASTE SYSTEMS INC COLUMBIA RIDGE LANDFILL STAR ROUTE BOX 6 ARLINGTON OREGON 97812 ARLINGTON OREGON 97812						ORIGIN VEH INIT & NO If charges are to be prepaid, write		
		The Later Charles	ereby iteratives that he is familiar with an the fe- eich the back thereof iset forth in the rivassification the said terms and conditions are hereby agre iss	in Stractf which gover	ins the transportation of			
oute		CUSTOMER			· · · · ·	R	-P ORDER N	0.
PRODUCT CODE AND DESCRIPTION	co	NTA:NERS	TOTAL UNITS ORDERED	SHIPPED	LOT. NO		INVOICING	HIPMENTS ONLY SINSTRUCTIONS PAYMENT
							Shipper ing to Invoice	Copy 3 of 's Bill of Lad- your Freight and mail to Poulenc Inc.
ARRIER REMARKS		Le	34	· ·			Condition but of laiment is in the considerate of t	ect to Section 7 of ns. of applicable ding. If this ship- o be delivered to ignee without re- no the consignor, signor shall sign wing statement carrier shall not livery of this ship- thout payment of nd all other lawfur
PLACARDS PROVIDED	ER DOT	CHIPPING	S NAME HAZARD CLASS	IDENTIE	CICATION NUMBER		1	ire of consignor)
PIECES HM KINDS OF PACKAGES — PROPE			NAME - HAZARD CLASS ONS - DOT EXEMPTIONS	- IDENTIF		DEN	Frt. Code	WEIGHT .
ONE EXCAVATED SOIL DUMP NON-HAZARDOUS W NOT A WASHINGTO PROFILE NUMBER	NAST ON S 185	E TATE 731						EST.
	ALLET		LOOSE		TOTAL	WEIGHT	→	50,000
"If the shipment moves between two ports by a carrier by water the law requires that the bill of NOTE. Where the rate is dependent on value, Imports are required to state specifically an entant declared value of the property is hereby specifically stated by the shipper to be not exceed RHONE POULENC INC. Shipper,	o:nç	r state whether it of a dec sted value	statters of shipper Reignt THIS SH		CORRECTLY DE	SCRIBED LBS.	COD Am Collection Total Char	Fee
Permanent post-office address of shipper. CN 5266 Princeton, NJ 08543-5266	7	. 9.	CERTIFICATION SIG	NATURE	1.8	12	L	
ATTN: TRANSPORTATION DEPT. (Note Freight Payment Instructions Above)			This is to certify that the abo and are in proper condition Transportation					

P RHÔNI	E-PO			TIRE B/L NO		SHIPI	PING ORDER A	ND BILL C	F LADIN				:	B/L NUMBER
RMONE-POULEN			=			-	Lading - Short F	_		-		ia Dill ad		SEA 2679
				•			d lawfully filed tari	tts in ettect		CATIC		DATE OR		SHIF DATE
			Αι	(origin)	• SE.	ATTLE	WA		From		Тс	<u> </u>		12-09-91
CARRIER	NO	RTHWEST	ENV	JIRONME!	NTAL	CA	RRIER CODE					CUSTON	ER NO	
							est to the classification and the					FOB		
OREGON	WA:	STE SYS	rems	SINC		as noted it unle- ng fulled below	nts, and condition of contents in which said harder the word cor proposation in possession of the c	t pickages unknow. Hier being ungersti	ni inulked (cos.gr ISB Inisughilu: this	red, and d richtract a	estined 11 Simedaning	L	ORIGI	N 1
		RIDGE L				of delivery at 5. Destination (I) V	aid destination of on its foute mutually agreed as triearn car on and as the ago party at any t	otherwise to Deriver Her of all or any of sa	to undiner carrier of properly over all	on the ros	ite to said Fon of said	VEH INI	I & NO	
STAR ROUTE BOX 6						nereunder snah be subject to a Literation Uniterm Freight Cla						arges are to be prepaid, write		
ARLING	TON	OREGON	978	312		Shipper her n Juding those	reby perioles that he is familial rin the back therept set forth in to the suid terms and runditions	with 4" the terms the classification (1)	and conditions of t lariff which governs	he said bi The transc	of lading artation of	or stan	np here, "	To be Prepaid."
bute						CUSTOMER	PO NO.				-	F	R-P ORDER	NO.
PROD	UCT C	DDE AND DE	SCRIF	TION	col	NTA:NERS		LUNITS			OT. NO			SHIPMENTS ONLY
							ORDERED		SHIPPED					G INSTRUCTIONS R PAYMENT
•														Copy 3 of
												1		r's Bill of Lad- your Freight
•						į								and mail to
								ļ				}	Rhone	-Poulenc Inc.
					ŀ									
						}						}		
						į			}					
					}									
					-									
					İ	Ì		ļ	}					
•						ļ								
		·			_		·							· · · · · · · · · · · · · · · · · · ·
ARRIER REMARKS													Conditi	oject to Section 7 of ions of applicable lading. If this ship-
		•											ment is the cor	s to be delivered to asignee without re- on the consignor.
													the loll	nsignor shall sign lowing statement carrier shall not
													make d meni w	elivery of this ship- vithout payment of and all other-lawful
			,										charge	
PLACARDS	PRO	VIDED				····								ture of consignor)
PIECES	нм	KINDS OF	PACK	AGES — PROF	PER DOT	SHIPPING EXCEPTIO	NAME — HAZARI NS — DOT EXEM	CLASS — PTIONS	IDENTIFIC	CATIC	N NUM	BER	Frt Code	WEIGHT
0		EVCAT	7 A TO E	D COTI	CONT	° 4 T N T N	G COPPER							
One Dump	'			RDOUS V			G CUPPER							
Truck		NOT A	. WA	SHINGTO	ON SI	CATE R	EGULATED	WASTE	Ε					
		PROF	LE	NUMBER	1857	731								
				F	OR FR	EIGHT CO	DE, SEE REVE	RSE SIDE	E					EST.
	4	TOTAL PIE	CES S	HIPPED; F	PALLET	s	LOC	SE		T	OTAL	WEIGHT	→	50,000
					ij fil		- 1944 - 1945 S	?લા <u>લ</u> કુજાઉ	<u> </u>	300) 5 }();	<u> </u>		
"If the snipment mov NOTE: Where the rate declared value of the	es Delween I e is depende e properly is	wo ports by a carrier by nt on value, shippers are hereby specifically sta	water the recured to	aw reduces that the bi- state spec fically in writ shipper to be not exce	ing the agreed	state whether it is or decrared while o	crame property The greed or		MENT IS C		TLY DE		CODA	
RHÔNE:						13	1//-	<u> </u>	WEIGHT IS .			LBS	Total	riges
		ddress of shipper,		Shipper	, rer 🗸	- 	Carrie			Per /	R	1/		
Princeton, NJ 0		6 ON DEPT.	Ci	<i>J</i>	,	٠,	CERTIFICA				<u>// .</u>	J JE-	<u> </u>	iged marked and labeled.
THANSI (Note Freight P	ayment i	ON DEPT. nstructions Above))	,	_	5'	and are in bro	per condition	mamed maleria for transportal	ion acc	oraing to	the applica	bie regulatio	iged marked and labeled, ns of the Department of
				1-			Transportation							
RA-58-2 C-7/89	1	COST DEF	דפ מפ	MENT .	2.		transportation							

		<u> </u>	ENTIRE B/L NO	. ON Y					ON THIS	NUMBE	\overline{R}	B/L NUMBER	
RHO	= =	DULENC	=	Str	aight Bill of	PING ORDER AN Lading — Short Fo	rm – Origina	- Not Ne	gotiable				
MHONE-POU	ici c	1	Received, subject to ti	he class	ifications an	d lawfully filed tarif	fs in effect on	the date o	f issue of th	nis Bill of	Lading.	SEA 267	
# -			At (origin)	: .	EATTLE	T.T.A		LOC	ATION-	DATE OF	RCERED	SHIF DATE	
			(3009.00)	. 3	CAILLI	. WA		From	7 6			12-09-91	
CARRIER	NOR	THWEST E	NVIRONMENT	TAL	CA	RRIER CODE				CUSTON	/ER NO		
					property descrip	est to the classification and tairf sed in the Griginal Bill of Lading th hts and condition of contents of	e property described be	e e r socarent cr	20 2106. 641631	FOB			
OREGON	WAS	TE SYSTE	MS INC	•	any person of c	is), bigw gifti raites Bies Bies dyidw. Dig ant la noissessa on noise pag	her being understoud ti perty under the Frintia	hrought ut this bont Stragrees 15 Jarry 1	ractius meaning. In its ushaliplace	VEH IN	IGIN	 	
COLUMB	IA R	IDGE LAN	DFILL		desimation line	aid destination of on its route, of mutually agreed as In earn carrie ion and as 10 earn party at any tin	e of all or any of said of	operty river arror at	y builton of said	1	harges are to be prepaid, writstamp here, "To be Prepaid."		
		BOX 6			Bill of Laging Se	nereunder shart be Subject to at Litorin Lite in Uniform Freigns Crass	ine termit and condition Acatholica in effect on the	ns of the Uniter in D t Gate hereof it this	omesiin Siri) ghi Sin in Tin in	If char			
ARLING	TON	OREGON 9	7812		Shipper her	or (2) in the applicable motor rail eby certilies that he is familiar is on the back thereof, set from in th	off ar the terms and r	conditions of the s	aid to chading	or stan			
7			•			id the said terms and conditions a						-	
Poule					CUSTOMER	P.O. NO.				1	A-P ORDER	NO	
						TOTAL	UNITS				DDEDAID	SHIPMENTS ONLY	
PRO	DUCT C	ODE AND DES	CRIPTION	CC	NTAINERS	ORDERED	SHI	PPEO	LOT NO	D		ARRIER:	
											-	ddress all ques-	
					}			1			tions re paymen	garding freight	
				- 1	1			1			paymen	1 10.	
1					1								
					}		}	}		1			
•								ł		ł			
_					ł		1	1		-			
					1			1		1	•		
					İ			1		1			
1]		}	- 1		}			
·				1	l	•		}		ŀ			
			•		}								
				-	{								
				- (1			- (1			
CARRIER REMARK	KS										Sut	ject to Section 7 of	
											ment :	ading If this ship- i to be delivered to	
										ł	Course	isignée wilhout re- on the consignor, nsignor shall sign	
											the fol	owing statement Carrier shall not	
										}	ment v Ireight	elivery of this thip- nithout payment of and all other lawly:	
										- 1	Rhone	Poulenc, Inc.	
PLACARI	OS PRO	VIDED								1		ture of consignors	
PIECES	нм	KINDS OF	PACKAGES — PROPI	ER DOT	SHIPPING EXCEPTIO	NAME — HAZARD NS — DOT EXEMP	CLASS - ID	ENTIFICA	TION NUM	BER	Frt. Code	WEIGHT	
077													
ONE	}	,	VATED SOIL			NG COPPER						1	
DUMP TRUCK	1		HAZARDOUS '								}	}	
ANUGR	}		A WASHINGT LLE NUMBER			REGULATED	WASTE				1	1	
		1 202	LEE MONDER	10.	,,,,						- 1	1	
		<u> </u>	F	OR FF	EIGHT CO	DE. SEE REVER	RSE SIDE				·	EST	
	*	TOTAL PIEC	ES SHIPPED; P	ALLE1	rs	LOO	SE		TOTAL	WEIGHT	· >		
			religion de la company				er ere	&@@@ <i>~</i> .{; <u></u>	પુંત્વે <u>કર્યાં</u> છે			50,000	
NOTE Where the	rute is decend	ent on value, shippers are re	ater the law requires that the bill of quired to state specifically in writing d by the shipper to be not excee	ng the agree	er State whether it it is or declared value i	of the procesty fire agreed of	THIS SHIPME		RECTLY DE	SCRIBED	COD A		
RHÔN	E-POL	LENC INC.	Shipper,	Da.	TP,	Carrier			er		Total of	• .	
		eddress of shipper,	snipper,	, 1				-	P	1/			
ceton, N	J 08543-52			11	1//	CERTIFICATI			· · · · · ·	, ,,,,,	/ <u></u>		
		TION DEPT.		11	11.	This is to certify the	nai the above-namer condition for t	ned materials a transportation	arcolaing to le biobeilà cis	the applica	pie iedniajio. Cuped byćeg	ged marked and labere is of the Dopartment	

ATTACHMENT 13

CONTROL # 91-030-U PERMIT # <u>LA-10a-91</u> CITY OF TUKWILA 6300 SOUTHCENTER BLVD. TUKWILA, WA 98188 ISSUE DATE: 7-1-91 EXPIRATION DATE: 1-1-92

KRADEX KXRIMIX RERMIX

Land Altering Permit

[] GRADE/FILL	CUT (Cubic Yards)	FILL (Cubic Yards)	
CONDITIONS:			
THE UNDERSIGNED H	EREBY APPLIES FOR PERMISSIO proceed with work		
	•	G VILLANUEVA ((206) 431-3674) OF COMMENCEME
AND COMPLETION OF	WORK AT LEAST 24 HOURS IN	ADVANCE.	
		98108 PROJECT NAME: Rhom	
NAME OF OWNER:		PHONE: (201) 297	-0100
	1 5266 Princton, New Jersey		
	Not yet selected		
ADDRESS:		ZIP:	
	22.50.000/000		
FEES PERI PLAN CHI	RIT FEE \$ 22.30 (000/322.1 ECK FEE \$ 32.50 (000/345.8	30) RECEIVED BY 5	LB
STATE SU		00) 30) RECEIVED BY 5 04) RECEIPT # 0040 DF	
Rhone R		CEPTS THIS PERMIT AND AGREES	
APPLICABLE SECTION FUKWILA SHALL BE I	NS OF THE CITY OF TUKWILA MU	NICIPAL CODE. WE AGREE THA	T THE CITY OF
PERMITS WHICH HAV	E LAPSED BEYOND THE PERMIT E	EXPIRATION DATE SHALL REQUIRE	: A REAPPLICATION
AND REISSUANCE OF	THE PERMIT THROUGH THE CITY	OF TUKWILA AT AN ADDITIONAL	・FEE(433-0179 ノ ぐんれんして
APPLICANT'S SIGNA		TITLE	
APPROVED BY:	(ance)	cc: APPLICANT	
		INSPECTOR CITY SHOPS	
PHILLIP FRASER, S	ENIOR ENGINEER, CITY OF TUKW	FINANCE DE	PT. (IF APPLICA
**		FIRE DEPT.	(IF APPLICABL
DHEREBY CERTIFY	THAT THE PERMIT HOLDER WHOSE T THE STANDARDS AND CONDITION	NAME AND ADDRESS APPEARS OF THE PROJECT APPROVED	THIS RECORD H
FIELD INSPECTION	1 /	CITY INSPECTOR MAN VI	Densey
		X///3/ V(
PARMIT NOT SIGNED		INITIALS	DATE
TE SUICE E		INITIALS	DATE

ATTACHMENT 14

CONTROL # 91-030-U PERMIT # H- | O1 - 9

CITY OF TUKWILA 6300 SOUTHCENTER BLVD. TUKWILA, WA 98188

ISSUE DATE: 7-1-91 EXPIRATION DATE: 1-1-93

[XX] HAULING
[] MOVING AN OVERSIZED LOAD

[] MOVING AN OVERSIZED HOAD
THE UNDERSIGNED HEREBY APPLIES FOR PERMISSION TO PERFORM HAULING PER ATTACHED MAP IN ACCORDANCE WITH THE FOLLOWING CONDITIONS: 1) FLAGGING, SIGNING AND CONING SHALL BE IN ACCORDANCE WITH MUTCD FOR TRAFFIC CONTROL; 2) CONTRACTOR SHALL PROVIDE CERTIFIED FLAGMEN FOR TRAFFIC CONTROL; 3) SWEEP OR OTHERWISE CLEAN STREETS TO THE SATISFACTION OF PUBLIC WORKS EACH NIGHT AROUND HAULING ROUTE (NO FLUSHING IS ALLOWED); 4) NOTIFY CITY INSPECTOR (433-0179) BEFORE 12:00 NOON ON FRIDAY PRECEDING ANY WEEKEND WORK; 5) PERMIT IS VALID BETWEEN THE WEEKDAY HRS OF 7:00 AM AND 3:30 PM ONLY; 6) CLEAN AND REMOVE DEBRIS FROM CITY CATCH BASINS IN AND AROUND HAULING ROUTE; 7) PROVIDE ADEQUATE TEMPORARY ACCESS AS NOT TO INTERFERE WITH OTHER VEHICLE MOVEMENT OR CAUSE TRUCKS TO TRAVEL OVER CURBS; 8) ALL VEHICLES MUST MAKE COMPLETE STOP PRIOR TO ENTERING PUBLIC RIGHT-OF-WAY. ADDITIONAL REQUIREMENTS:
ANTICIPATED TIME OF START: END TIME:
THE APPLICANT MUST NOTIFY CITY INSPECTOR GREG VILLANUEVA ((206) 431-3674) OF COMMENCEMENT AND COMPLETION OF WORK AT LEAST 24 HOURS IN ADVANCE.
SITE ADDRESS: 9229 East Marg. Way S. Seattle 98108 PROJECT NAME: Rhone-Poulenc Inc
NAME OF OWNER: Rhone-Polenc PHONE: (201) 297-0100
ADDRESS: CN 5266 Princton, New Jersey ZIP: 08543
CONTRACTOR: Not yet selected PHONE: ADDRESS: ZIP:
ADDRESS: ZIP:
·
FEES PLAN CHECK FEE \$ 10.00 (000/345.830) INSPECTION FEE \$ 15.00 (000/342.400) TOTAL \$ 25.00 RECEIPT #
Rhone Poulenc Inc. accepts this permit and agrees to abide by all applicable sections of the city of tukwila municipal code. We agree that the city of tukwila shall be held harmless from all or any claims arising as a result of this project.
PERMITS WHICH HAVE LAPSED BEYOND THE PERMIT EXPIRATION DATE SHALL REQUIRE A REAPPLICATION AND REISSUANCE OF THE PERMIT THROUGH THE CITY OF TUKWILA AT AN ADDITIONAL FEE (433-0179)
APPLICANT'S SIGNATURE Jus 5. C. Forg TITLE Chief Che La L.
APPROVED BY: CC: APPLICANT INSPECTOR CITY SHOPS
PHILLIP FRASER, SENIOR ENGINEER, CITY OF TUKWILA FINANCE DEPARTMENT POLICE DEPARTMENT

I HEREBY CERTIFY THAT THE PERMIT HOLDER WHOSE NAME AND ADDRESS APPEARS ON THIS RECORD HAS SATISFACTORILY MET THE STANDARDS AND CONDITIONS FOR THE PROJECT APPROVED HEREIN.
FIELD INSPECTION DATE 12/12/91 CITY INSPECTOR May Volante
PERMIT NOT SIGNED-OFF BECAUSE
INITIALSDATE

ATTACHMENT 15



CITY OF TUKWILA
6200 SOUTHCENTER BOULEVARD, TUKWILA, WASHINGTON 98188

PHONE # (206) 433-1800

Gary L. Van Dissen. Mayor

TC /00 /7T

Shoreline Management Act of 1971 PERMIT FOR SHORELINE MANAGEMENT SUBSTANTIAL DEVELOPMENT CONDITIONAL USE OR VARIANCE

			File Num	nber: 91	1-05-SMP	
•			Approved	XXX	Denied_	
,		·	Date:	July 1,	1991	
TYPE OF ACTION:	XXXX Substantia	l Development P	Permit	☐ Conditi	onal Use	☐ Variance
	to RCW 90.58, a	a permit is her	reby grant	ed to:		-
	take the follow					
300-400 y upon the	l to present gra yds. into the Du following prope ast Marginal Way	wamish River. erty (legal des	ACOE has scription	indicated, i.e., sec	no demolitition, town	s approximately ion permit is need ship, range):
	THE PROPOSED PI AND ITS ASSOCIA SIGNIFICANCE A	ATED WETLANDS,	WHICH IS	A SHORELIN	E OF STATE	
	owing master pro che Master Progr					
not have Developm	y will implement e a master shore ment pursuant to t to the followi	line program f this permit sl	or this a	rea. ndertaken	gram since	<u>the City doe</u> s
		N/A				
•						

This permit is granted pursuant to the Shoreline Management Act of 1971 and nothing in this permit shall excuse the applicant from compliance with any other federal, state or local statutes, ordinances or regulations applicable to this project, but not inconsistent with the Shoreline Management Act (Chapter 90.58 RCW).

This permit may be rescinded pursuant to RCW 90.58.140(8) in the event the permittee fails to comply with the terms or conditions hereof.

CONSTUCTION PURSUANT TO THIS PERMIT WILL NOT BEGIN OR IS NOT AUTHORIZED UNTIL THIRTY (30) DAYS FROM THE DATE OF FILING WITH THE DEPARTMENT OF ECOLOGY AS DEFINED IN RCW 90.58.140(6) AND WAC 173-14-090, OR UNTIL ALL REVIEW PROCEEDINGS INITIATED WITHIN THIRTY DAYS FROM THE DATE OF SUCH FILING HAVE TERMINATED; EXCEPT AS PROVIDED IN RGW 90.58.140(5)(a)(b)(c).

July 3 1881 Director, Planning Department

Construction or substantial progress toward construction must begin within two years from date of issuance, per WAC 173-14-060.

THIS SECTION FOR DEPARTMENT OF ECOLOGY USE ONLY IN REGARD TO A SUBSTANTIAL DEVELOPMENT PERMIT WITH A CONDITIONAL USE OR VARIANCE PERMIT.

DATE RECEIVED BY THE DEPARTMENT :							
APPROVED (date):	DENIED (date):						
This conditional use/variance pursuant to Chapter 90.58 RCW	permit is approved/denied by the department						
Development shall be undertaken p following additional terms and co							
	· · · · · · · · · · · · · · · · · · ·						
Date	(Signature of authorized Department official)						
cc: Applicant, File, D.O.E.							
(25/SHOR.PMT)	•						